Vendex

Board Meeting on growth & profitability strategy

By Group A11

Executive Summary

Via operational excellence and product optimization we will boost Vendex profit by 12%

Business Case

- Vendex is a leading vending and coffee services company in Europe, with a turnover of 984 million euros in 2017
- Leveraging Big Data and Advanced Analytics, we aim to grow the business by **boosting sales, cutting costs and achieving operational excellence**
- Recommendations are based on 4 data sets from January 2nd to April 1st in 2017. The data sets includes information of the products, transactions, and machines.

Identified levers

1. Bundle items
2. Optimize Product Portfolio
3. Early Warning System
4. Switch Small/Big machines
5. White-label products

Profitability Impact & Action Plan

Profit boost of 12% as well as customer loyalty and competitiveness

Product Optimization and **Bundling** will be tackled first as the needed resources are lowest

Operational Excellence initiatives will be implemented mid-term as well as the **White-label** solution

1. **First Exploration of Datasets**
2. **Optimization levers**
3. **Next steps**

First Data Exploration – Data Set Overview

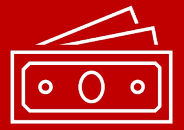
Data of 2,495 machines, 63 products and 1.84 M transactions was analysed

Machines

- 2,945 machines in total
- 38.44% of all machines are small
- 58.52% of machines at transport stations, 13.75% at petrol stations and 27.7% at other locations

Products

- 63 products total
  - 20.63 % are Carbonates & Energy drinks
  - Drinks sell for 3,18 € vs snacks 2.42 € on average
  - Milk-based products (3.43 €) have the highest average price while sugar candy has the lowest average price (2.30 €)



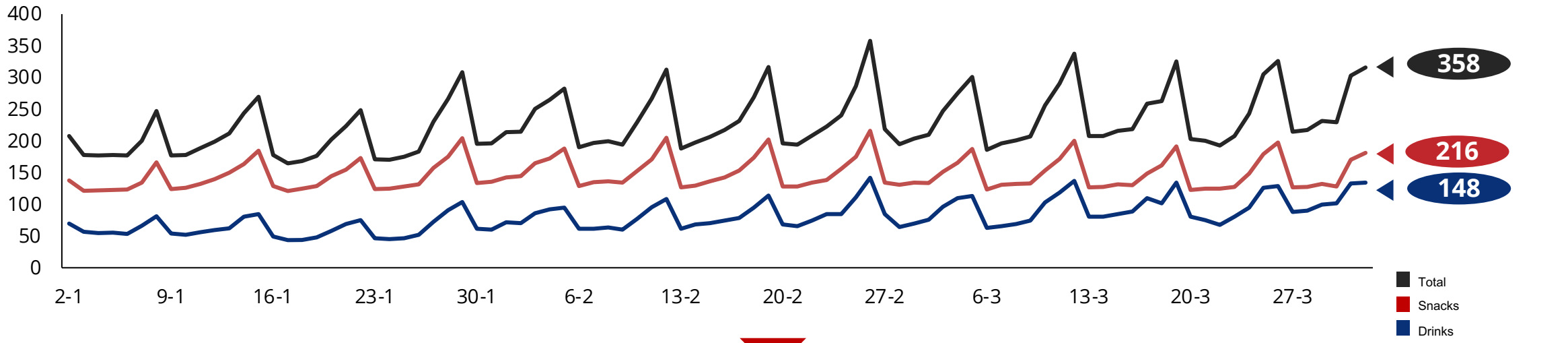
Transactions

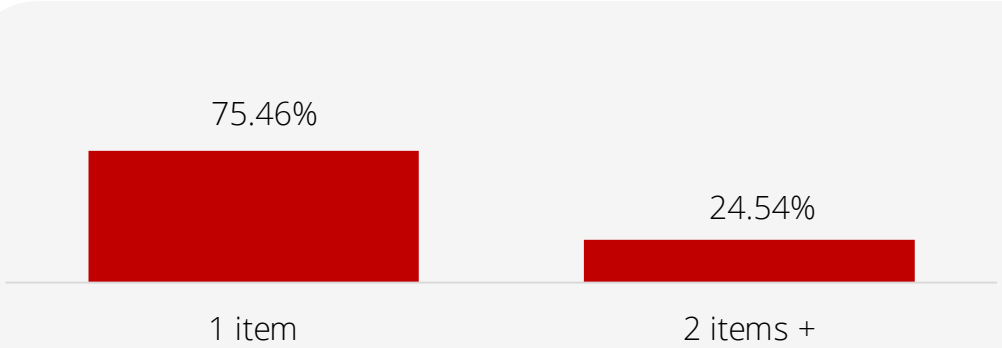
- An average of 738 transactions per machine during the period
- 1.84 Mn transactions in total

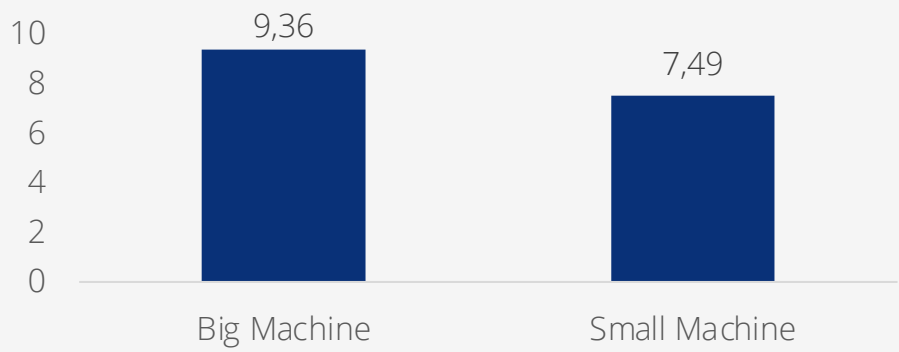
Data Deep Dive – Sales

Sales are boosted on the weekend with 75% of customers buying only 1 product

Distribution of transactions







* Two transactions belong to the same client if the time difference between them is less than 60 seconds

1. First Exploration of Datasets
2. **Optimization levers**
3. Next steps

Optimization Levers

Operational Excellence, Assortment Optimization & Entrepreneurial Initiatives will help defend long-term profitability for Vendex

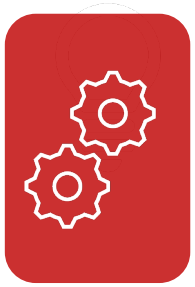
Offer Menus

Bundle items that are often **sold together**

Product Optimization

Replace **worst performing** products with **best performing** ones

Ensure products are placed in their **optimal slots**



Early-Warning System

Upgrade the current Early Warning System

Optimize machine size

Capitalize on localized demand highs by **switching small and big machines**

White Label Production

Create our **own Vendex brand** for 2 of our most popular products

Menus

Bundling best selling items together will help boost sales and provide a seamless customer experience

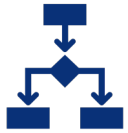
→ We decided to focus on increased sales volume and a seamless customer experience to boost profitability and long-term loyalty
→ If the menus prove successful further experimentation with high/low bundles will be performed

Bundle bestsellers

Sales volume
Bundling products that are often bought together can increase the overall volume of sales and help boost Vendex profits

Customer experience
Offering products that are often bought together can also improve the customer experience

Bundle high and low performing products



Variety
Offering a mix of bestsellers and less popular items can provide more variety for customers and allow them to try new things

Inventory management
Offering a mix of products can also help with inventory management, to sell items that do not sell as well as expected

Menus

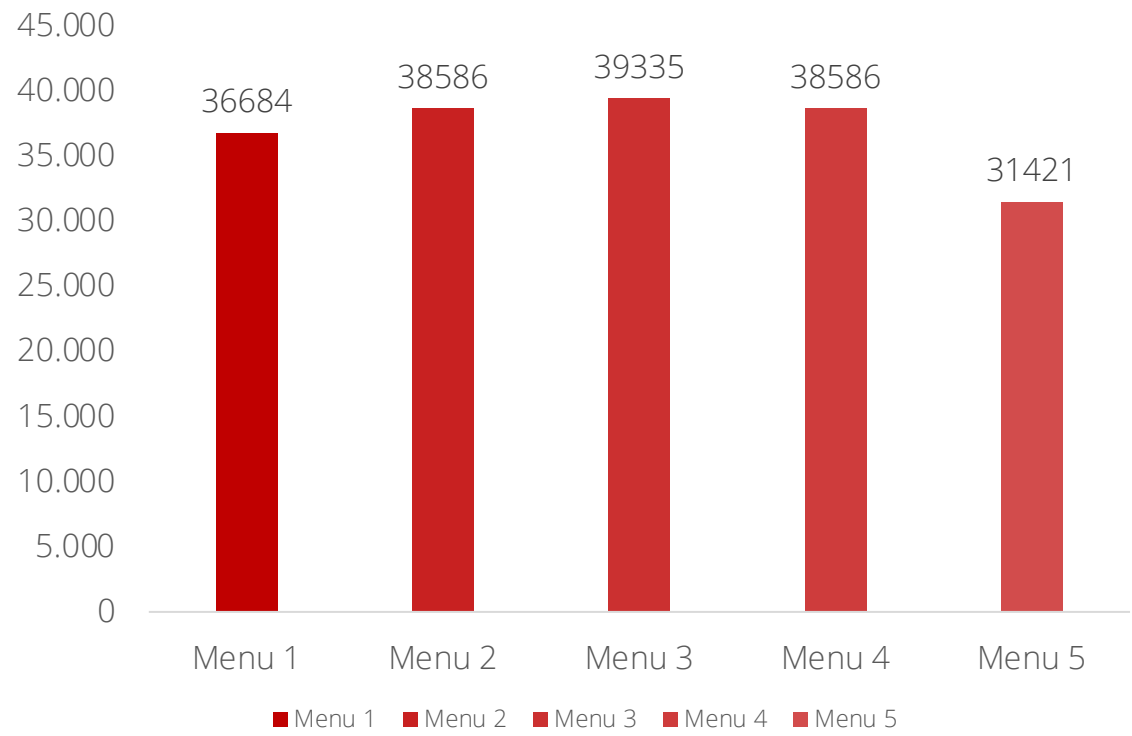
Implementing menus for the top 5 product combinations will boost profit by 1.47 %

- We assume that products bought within 60 sec at the same machine are bought together
- We assume a discount of 10% on popular bundles which will lead to a 20% sales boost

Top 5 combinations*

64.545	Chocolate-based 1 & Chocolate based 2
59.128	Chocolate-based 1 & Fruit Juices 1
58.917	Chocolate-based 1 & Sugar Confectionary 1
57.523	Chocolate-based 2 & Fruit Juices 1
55.156	Chocolate-based 2 & Sugar Confectionary 1

Yearly Profit Increase



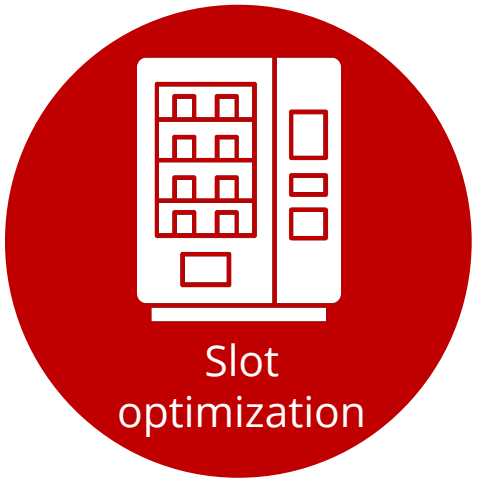
* Sum of avg daily sales per machine

Product optimization

Ensuring that the best performing products are present in all machines can minimize lost sales and boost profits

→ Different product optimization strategies were considered with the objective of optimizing the current product portfolio
→ We decided on monitoring top and worst performers across all machines as well as per slot to boost profitability

Top-performing products are present in all machines and worst-performing ones are switched out



Each product sold is present in its best performing slot

Feasible: Can make reasonable assumptions with available data

Shifting product lineup across seasons to ensure best performing products are available

Requires assumptions for three out of four seasons

Product optimization impact

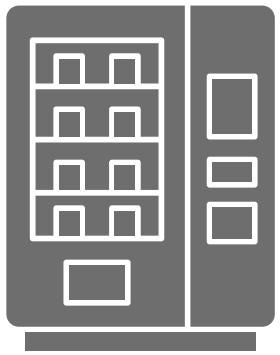
Optimizing the product portfolio per machine will boost profits by 3.4%

→ By replacing the worst-performing snacks and drinks with top performers, daily sales and profits will increase
→ The implementation of this strategy considers the efficiency of each product in every machine (efficiency = daily sales per product / average daily sales per category)

Process

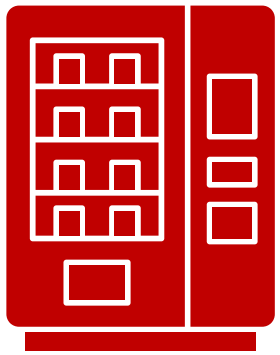
1. Identify the top and worst-performing snacks and drinks
2. Compute the number of replacements needed to switch
3. Compute daily sales boost from replacements

Status Quo



Worst snacks:
"bakery_and_pastries_6"
"chocolate_based_11"
"bakery_and_pastries_3"
"sugar_confectionary_incl_gums_5"
"bakery_and_pastries_4"

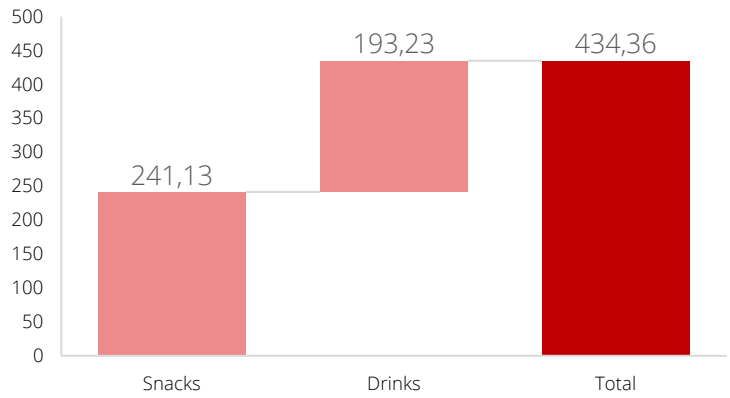
New lineup



Best snacks:
"sugar_confectionary_incl_gums_1"
"chocolate_based_1"
"chocolate_based_2"
"sugar_confectionary_incl_gums_7"
"chocolate_based_3"

Initiative Impact

Additional profit (in thousand $USD)



+ $434.3 K yearly profit increase

+ 3.39% profit boost

*Best and worst drinks also included in the analysis

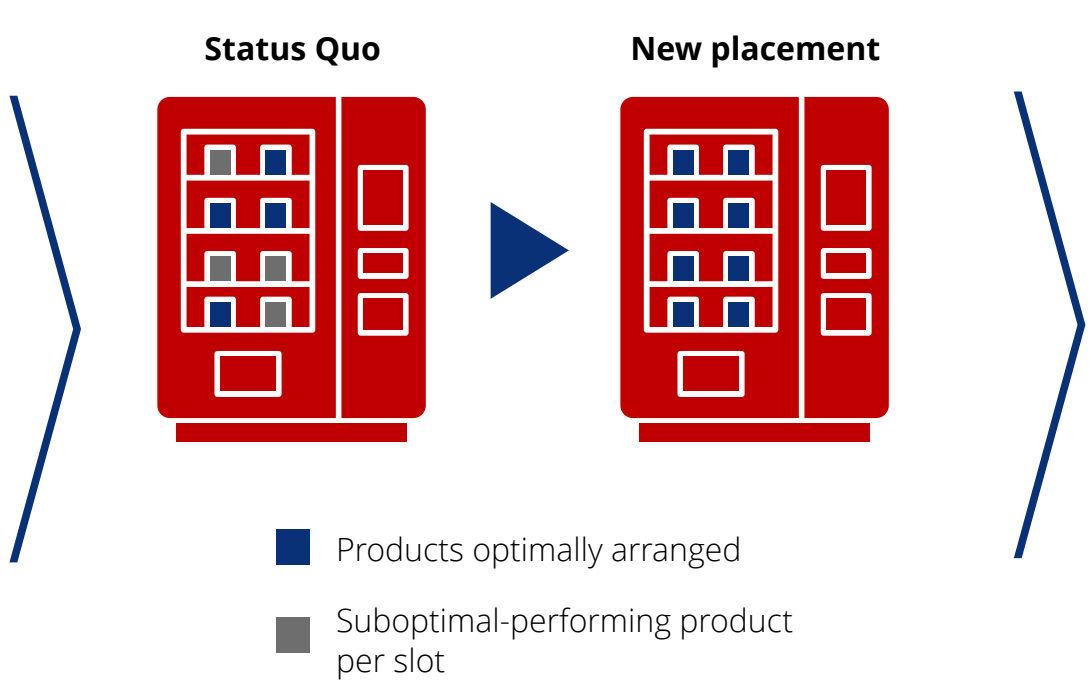
Product optimization impact – per slot

Optimizing the product portfolio per machine will boost profits by 0.2%

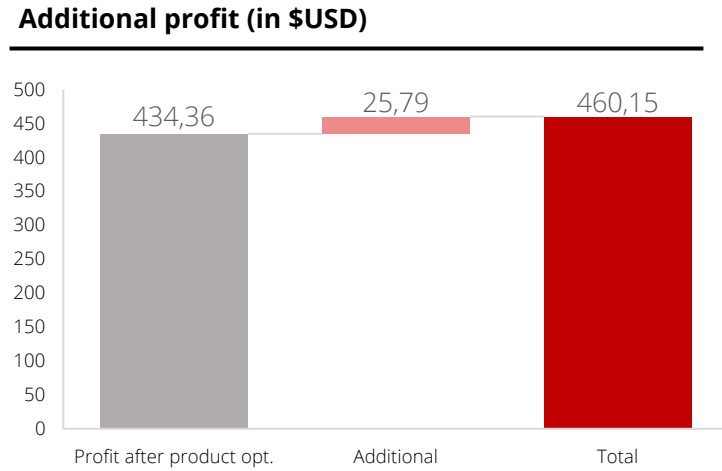
→ By applying the slot optimization strategy, we can ensure that the best-performing products are placed in the most effective slots
→ This approach takes into account the efficiency of each product in every machine, adjusting for variations in machine performance

Process

1. Determine efficiency for each product per machine
2. Rank product performance per slot
3. Rearrange the products in the slots



Initiative Impact



+ 25.79 K yearly profit increase

+ 0.20% profit boost

Upgrade Early Warning System

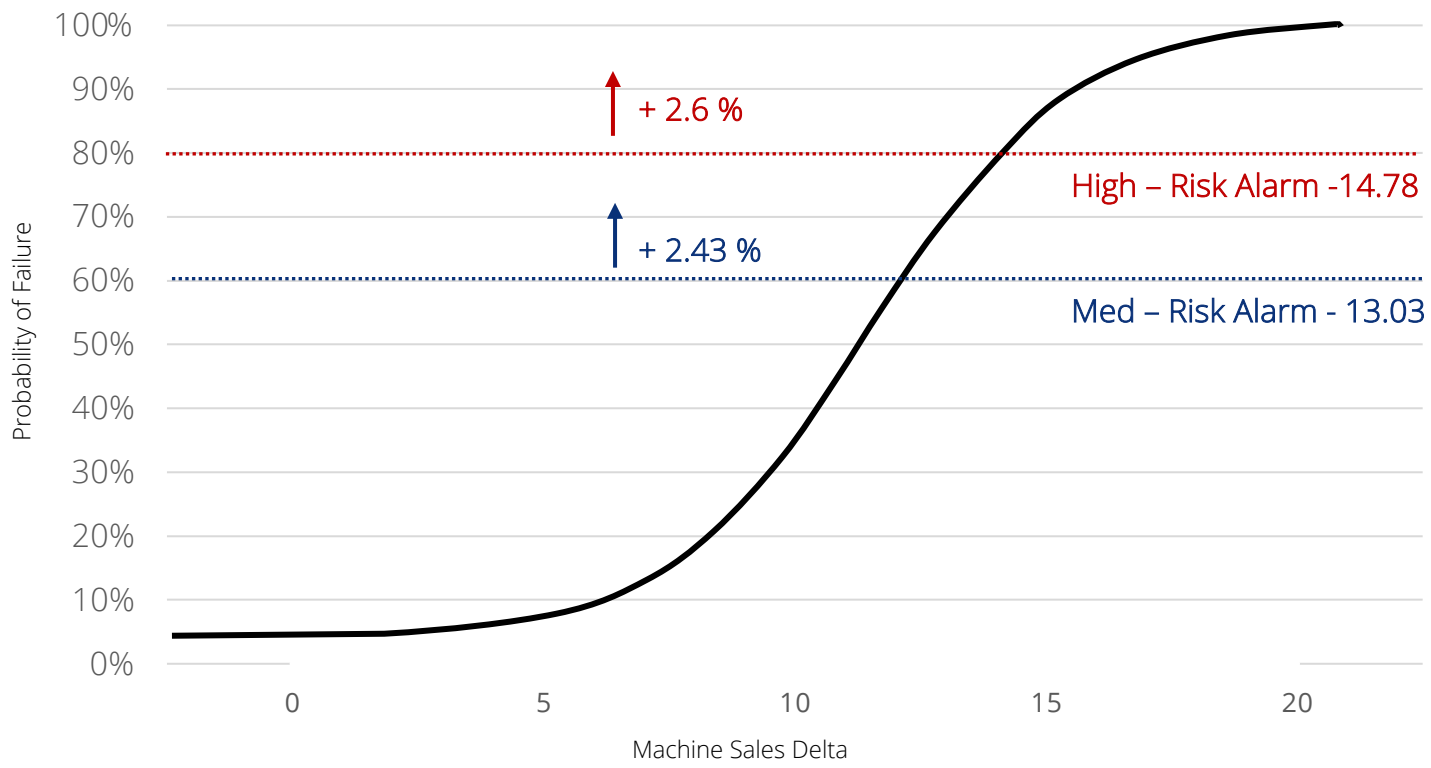
Implementing a high-risk EWS system will increase profits by 2.6%

→ Current Status Quo is that machines are repaired after they broke down
→ Setting up a predictive Early-Warning system will help us reduce machine time out delta and thus boost sales

Top 5 combinations*

1. Sales deltas as main indicator for machine failure
2. Calculate costs & revenues for both options
3. Compare to the current system

EWS – Probability of Failure by machine delta



Switch Small and Big Machines

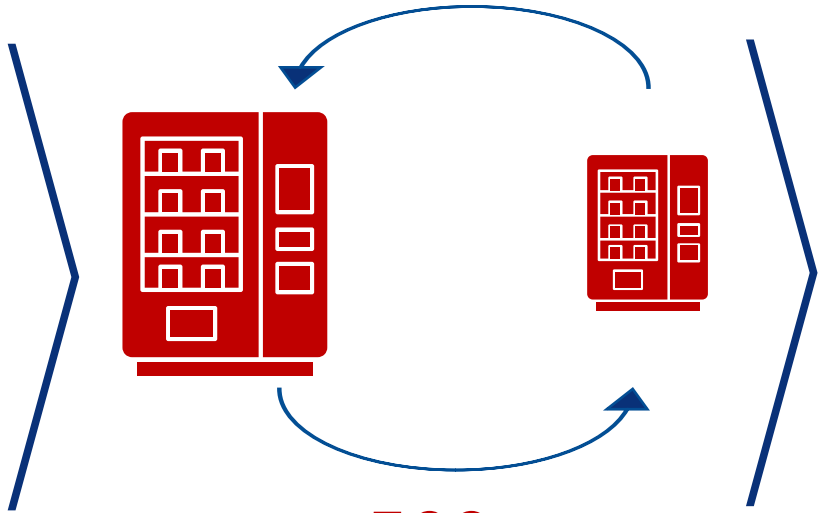
Switching small and big machines will boost sales by 4.15%

- → Size of the vending machine is a key driver of sales
- → Holding all factors constant, a bigger machine sells 1.65 more units on average
- → The cost of switching 2 machines lay around $500

Process

1. Run a regression & extract the coefficient for small machines
2. Calculate Increase & decrease for switching on avg. daily sales
3. Switch where the difference is higher than costs

Initiative Impact



509
machines will be switched

+ $519 k yearly profit increase

+ 4.15% profit boost

Appendix 1&2: Alternative strategy to machine size optimization

White-label Sales

Offering our own chocolate and candy treat will boost respective product profits by 0.1%

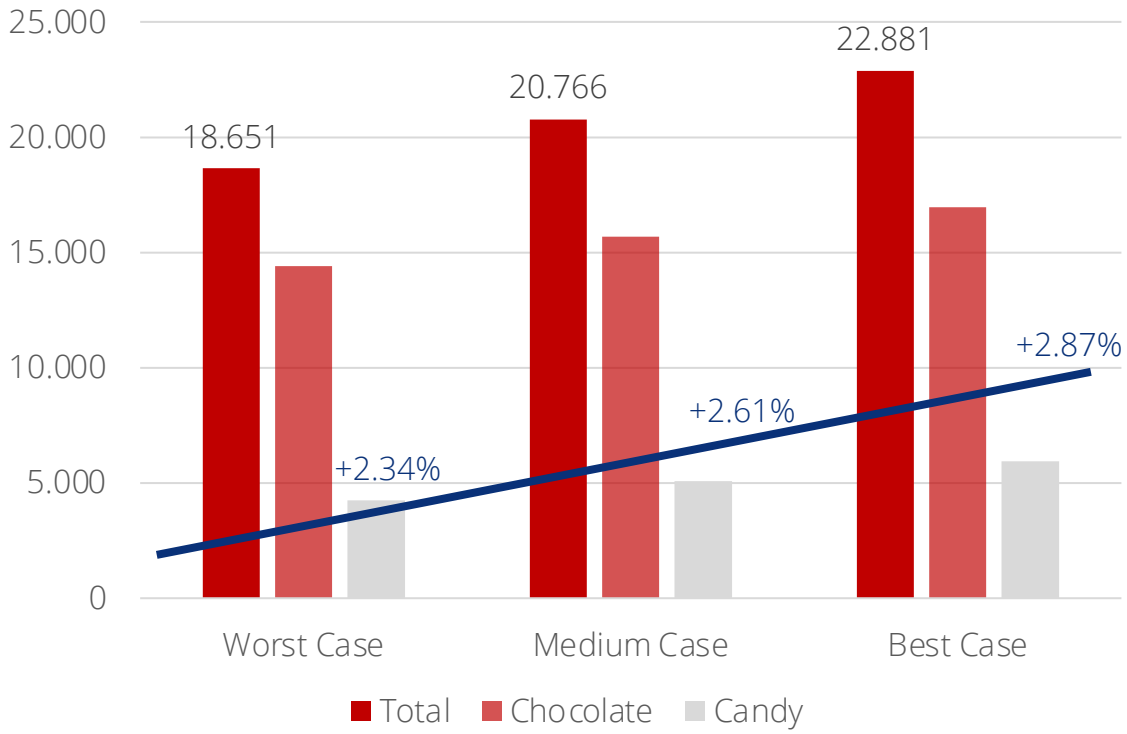
- We assume that offering our own Vendex brand of chocolates and sugar treats will help boost our brand image and allow us to increase profit margins
- We assume a 10% discount from our suppliers and a $15k investment per category for new packaging & marketing

Scenario Analysis of most popular treats

	Chocolate	Adjusted Chocolate	Candy	Adjusted Candy
Profit boost	6.390	-8.609,2	4.185,5	-10.814,4
Worst case: 15% sales boost	29.397,3	14.397,3	19.253,5	4.253,5
Medium case: 20% sales boost	30.675,4	15.675,4	20.090,6	5.090,6
Best case: 25% sales boost	31.953,6	16.953,6	20.927,8	5.927,8

→ The Whitelabel aids the sales boost of our bundling strategy (20%)

Yearly Profit Increase for both products



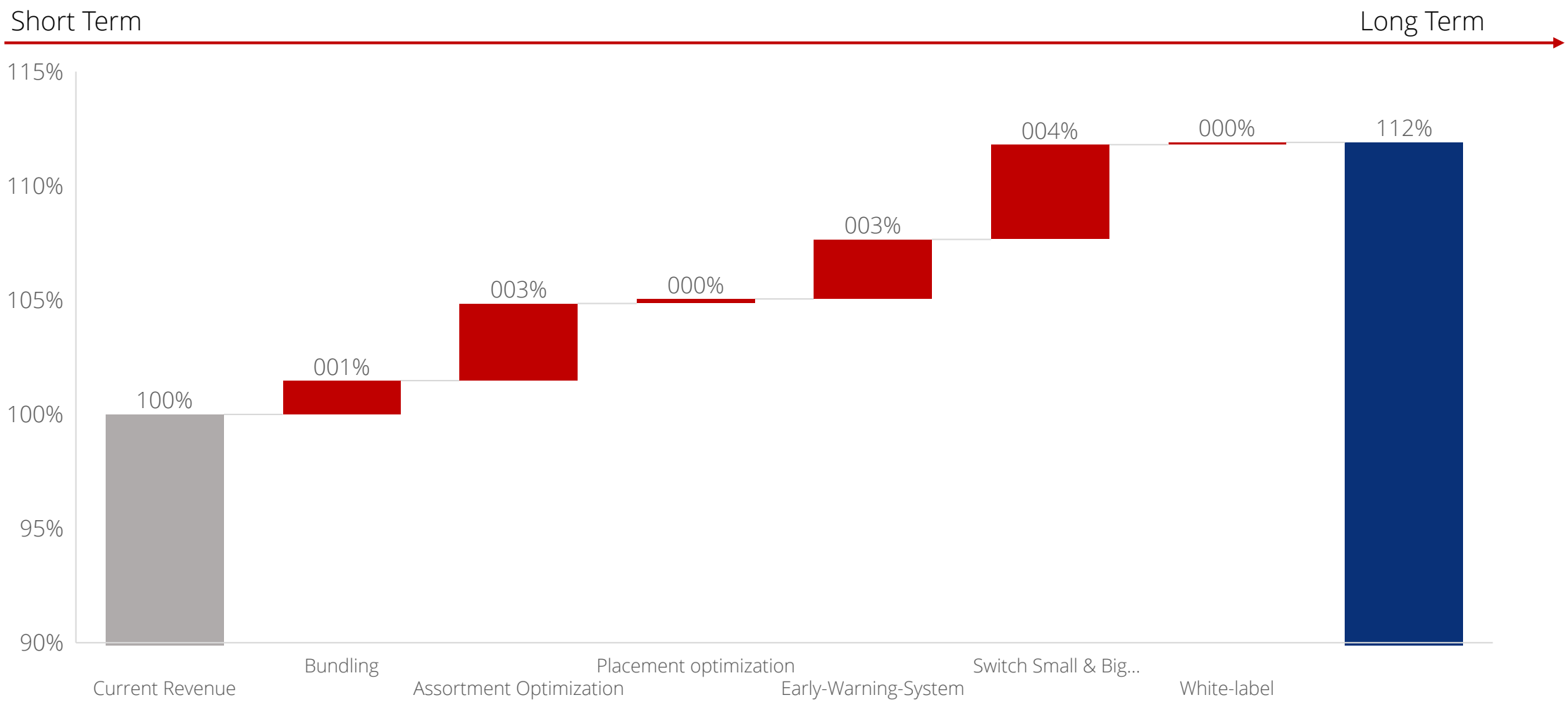
1 First Exploration of Datasets

2 Optimization levers

3 **Next steps**

Profitability Impact

Within 1 year we expect to have increased our revenue by 12%



Action Plan

First initiatives revolve around assortment optimization and will then tackle operational excellence

Short Term — Long Term

Offer Menus & Optimize Assortment

- Since Vendex owns the machines and supply channels, we can start the assortment optimization instantly
- Outlook: Collect data on seasonal as well as trending products

EWS & machine size optimization

- Upgrades of the warning system as well as physical relocation require more planning and capital resources
- Execution is planned within the next 6-12 months

White-label solution

- Renegotiations with suppliers as well as marketing efforts into the new line is a relatively big project
- Execution is planned within the next 12-24 months

Appendix

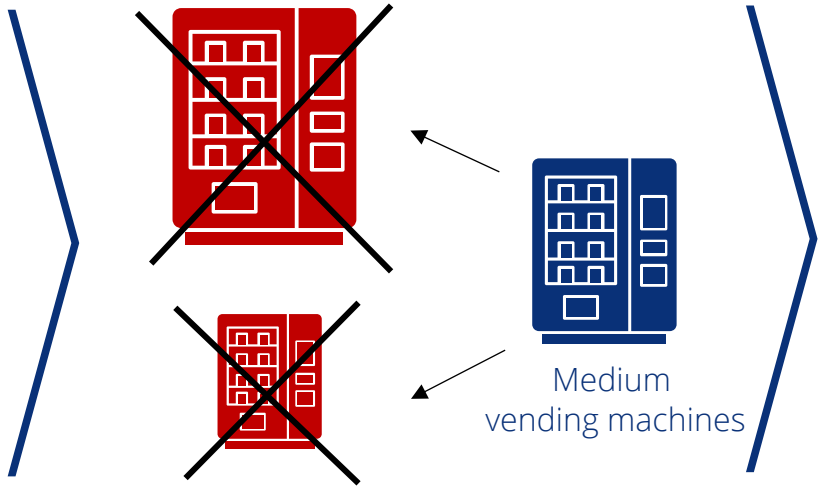
Alternative: Replace all machines with Medium-sized machines

Replacing all machines by medium machines would only boost sales by 0.7%

- → When replacing machines we could potentially standardize our vending machine size, thus leveraging economies of standardization and higher negotiation power with suppliers (cost reduction)
- → We assume that small machines would have a sales boost of 1.15 and big machines a loss of 0.92

Process

1. Calculate average daily sales across all machines
2. Calculate boost & reduction factors for small/big machines sales
3. Extrapolate profit taking into account the switching costs



Initiative Impact

+ $143 k yearly profit increase

+ 0.7% sales boost

We decided to pursue the switching strategy instead since the investment will be much lower and we will still be able to capitalize on demand peaks with big machines and still cover less attractive stations for brand presence with small ones

Calculations: Replace all machines with Medium-sized machines

Replacing all machines by medium machines would only boost sales by 0.7%

Process

Machine	Average Daily Sales	Adjusted Sales Boost	Adjusted sales	Threshold
Big Machine	9.37	1+ (8.64-9.37/9.37) = 0.92	Sales_if_medium = daily_sales * sales_boost_big change_sales = sales_if_medium - daily_sales	Sales_if_medium > cost
Small Machine	7,5	1+ (8.64-7.5/7.5) = 1.15	Sales_if_medium = daily_sales * sales_boost_small change_sales = sales_if_medium - daily_sales	Sales_if_medium > cost
Medium Machine	8.64 (overall daily sales)			

We assumed that through the standardization of machines significant cost savings (enhanced negotiation power & easier maintenance) could be realized with a maintenance of current sales.
Together with the cost of changing machines we estimated the cost threshold to be $1000