BUSINESS

PROPOSAL

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Inhoud

Management Summary

Our proposal aims to reduce the high number of product returns experienced by Van Gastel Shoes using AI. This will help to increase the company's profitability and reduce the CO2 emissions associated with product returns. Our team of students supported by Fontys will analyze the return rates of Van Gastel Shoes and develop a customized strategy to improve the number of returns.

We have identified that up to 50% of online sales of shoes are returned, with half of all shipments returning one or more pairs. This has a significant impact on the number of parcel deliveries, unnecessary kilometers, CO2 emissions, and road safety in residential areas. We have discovered that the children's brand (BJR) experiences the highest number of returns, making up a considerable percentage of the overall returns.

Our research will focus on identifying the different characteristics of the shoes and to get more insight into why people are returning their shoes. Also we look at the different datasets that are provided by the company: product data, sales data & Zalando data. In the product data we have all the information about the shoes(e.g. material, size, style). In the sales data we have the data of the sales, which shoe has the most sales for example and the same goes for the Zalando data.

For this project we will be using machine learning to predict the return occurrences. For example the AI model is predicting a specific shoe that has a opportunity of 80% getting returned. In this way the company can take action on this specific shoe, such as improving the quality of the shoe or the price.

Our approach involves various research methods, including interviews, data analytics, literature study, model evaluation, and prototyping. We will present the results of our project to Van Gastel Shoes through a pitch and a poster.

Overall, our project's goal is to help Van Gastel Shoes reduce their carbon footprint and their return percentages, resulting in fewer costs and a positive impact on the environment.

Introduction

We have a proposal to reduce returns on your shoe products using AI. Returns can have a significant impact on your profitability, but we believe that we can help. Our team of students, supported by Fontys, will analyze your return rates to identify patterns and trends. We will then develop a customized strategy to improve the number of returns. Our goal is to increase your profitability and reduce CO_2 emissions from deliveries associated with product returns using AI. Thank you for considering our proposal.

Company Background

Van Gastel Shoes are specialist in shoes, they have a history for over more then 175 years in the shoe industry. It is a real family business with the 5th generation. Van Gastel shoes designs, produces, distributes and sells shoes for its own labels. Van Gastel shoes also provides this service for private labels(such as OMODA). In addition, Van Gastel Shoes has a long-term worldwide license to design, produce & market shoes for the McGregor brand.

Production takes place in countries such as Turkey. The sale takes place through various channels, including retail, own web shops and websites such as bol.com, Zalando etc.

Staff and locations:

Van Gastel employs approximately 25 employees in the Netherlands(Gilze), the design department consists of 1 designer in permanent employment and 3 self-employed designers. In addition, there is a purchase office, which is located in Hong Kong. This office oversees matters such as materials used(such as safety) and the prevention of child labour.

Company Goal

The Company wants to reduces their carbon footprint and their return percentages. So they have less costs and do a good thing for the world, to reduce their carbon footprint.

Problem Definition

The online sales of fashion result in many returns, up to 50%. Van Gastel Shoes sells 70.000 orders online, sometimes several pairs of shoes. Half of the shipments return one or more pairs. This has a significant impact on the number of parcel deliveries, unnecessary kilometres, CO2 emissions and road safety in residential areas. Perhaps not even all returns can be resold and products will be destroyed if they turn out to be unsaleable.

As a conclusion the main problem of the project is that too often customers are returning their shoes. This ensures that there will be extra costs and also the carbon footprint is too large. So the main goal of the project is to find out why customers are returning their shoes and how data can help to find a solution to reduce the return percentages and at the same time reduce the carbon footprint.
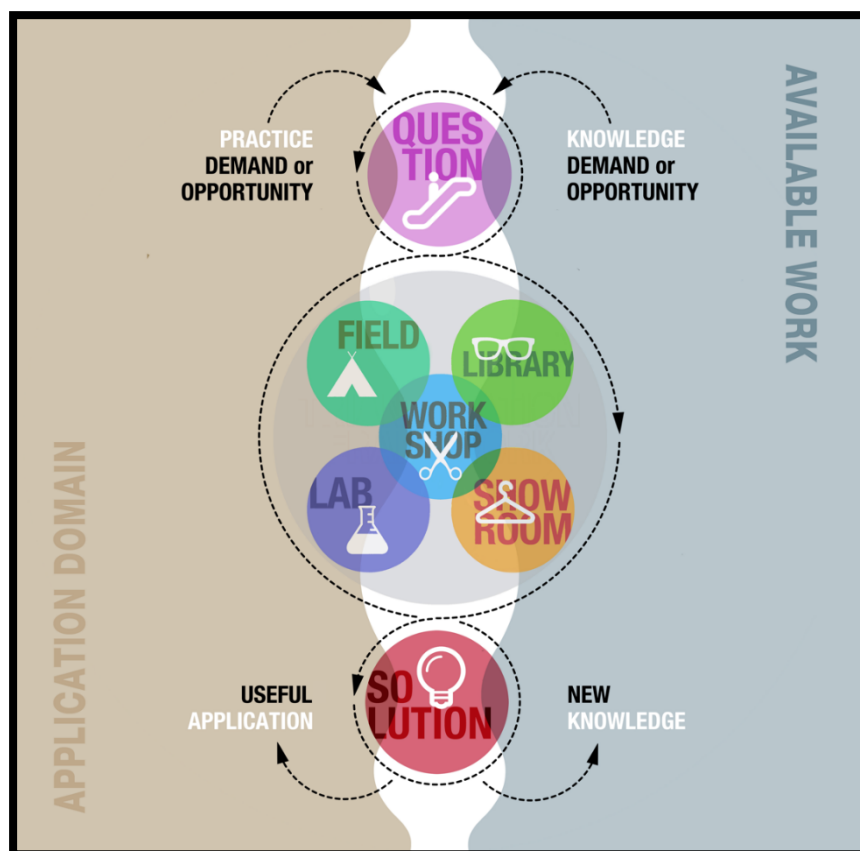
Research Questions

MainQuestion:

Which product characteristics are most closely associated with high rates of returns, and how can AI be used to address these issues?

Sub-questions

i. What are the main characteristics of the shoe(e.g. material, size, style) that are most strongly correlated with returns?

ii. How can Van Gastel shoes use AI to identify patterns or trends in customer returns data that might be missed by traditional analysis techniques?

iii. Can machine learning algorithms be utilised to develop predictive models that forecast returns based on product characteristics, and if so, which specific AI models are best suited for this task?

iv. To what extent is it possible to better communicate the product characteristics to the internet user?

Research Methods

Question	Method /Strategy	Explanation
Sub-question 1	Interview – Field EDA-Field Data Analytics – Lab	Interview to gain more knowledge about the business and subject. Data Analytics gain insights by measuring and analysing order and return data. With Data quality we can find some errors in the data that we need to filter out.
Sub-question 2	EDA – Field Data Analytics – Lab	By using EDA we can visualise the data to find out some trends. Data Analytics gain insights by measuring and analysing order and return data. With Data quality we can find some errors in the data that we need to filter out.
Sub-question 3	Model Evaluation – Lab Model Validation - Lab Litrature study - library	Testing the trained model. Translate the Machine Learning models to communicate them to the stakeholders and validate them. With literature study we are going to research why people are returning their shoes. For example, we can look at other shoe companies
Sub-question 4	Pitch - Showroom Prototyping – Workshop Litrature study - library Interview – Field	With the pitch we going to show the results of our project to Van Gastel Shoes. Prototyping we are going to make a poster in week 10 and for the end result a dashboard. With literature study we are going to research why people are returning their shoes. For example, we can look at other shoe companies Interview to gain more knowledge about the business and subject.

EDA

For the data analysis we have worked with jupyter notebook to get some insights into the data. For example we have checked the correlation in the product data. Black stands for that there is no correlation at al. The orange correlation is alright, the columns size & price are the best correlated of this graph. You have also the socre 1.0, that is the perfect score. Because it is compared to the same column.
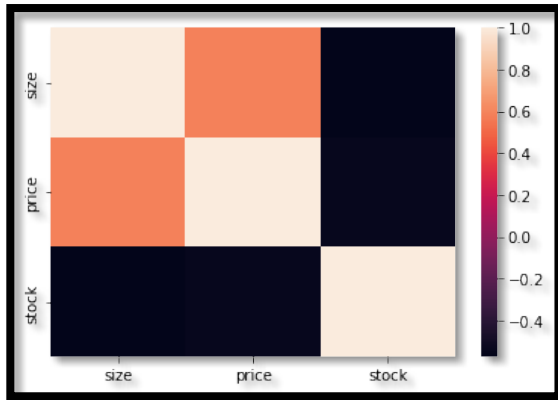
Now for the sales data we found out that the children brand(BJR) gets the most returns than other brands. We need to look at the number -1, this will show the amount of returns. This graph will show that the brand BJR is getting the most sales but also the most amount of returns. Also percentage wise the return rate is really high of the brand BJR. The brand BJR are children shoes, that is an interesting fact to know.
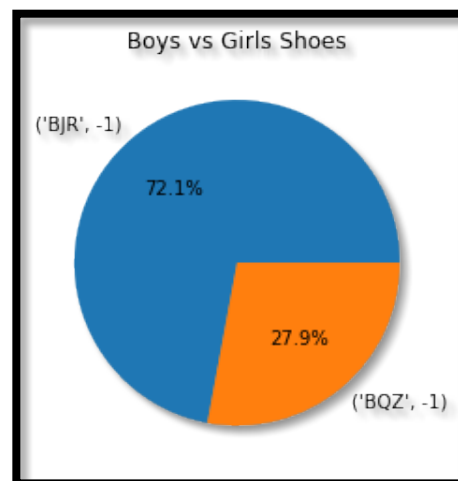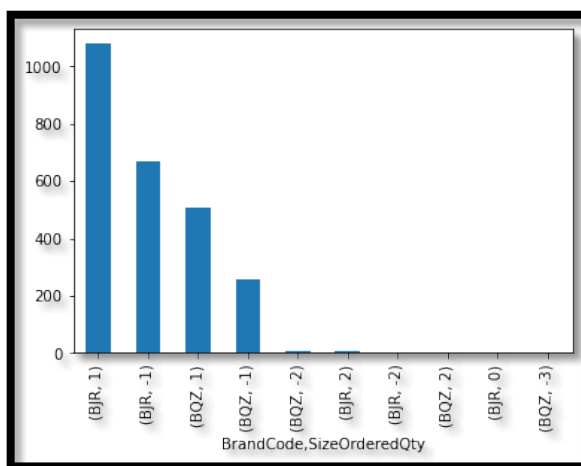
Goals

The goal of the project is to help Van Gastel shoes reduce the number of returns of shoes bought by customers and optimise logistics. With reduced returns, Van Gastel shoes will avoid waste and loss in case returns are unsaleable, save money used for parcel deliveries, reduce CO_2 emissions and reduce road safety risks in residential areas. The group intends to build a model that will predict the possibility of a shoe being returned. This will help determine the characteristics of the shoe that is likely to be returned and work to improve that hence reducing the return rates.

Scope

The project includes:	The project does not include:
A model that predicts the return occurrence	All the deliverables that are not needed to finish the goal are out of the scope of this project.
A dashboard that will show the trends in the return data	
The project will be finished this semester.	

Deliverables

The deliverables of this project include

- ❖ Visualisations
- ❖ Jupyter Notebook of modeling
- ❖ Model to predict the return occurrences

Model Selection

To predict the return occurrences and find insights the following model/s will be used, this may change during the project period.

- Classification of return rate based on product and sales data using Advanced Neural Network (ANN).
- Random Forest, XGBoost.

Planning

Project tasks	Start date	End date
Business Proposal	**13-02**	**10-03**
draft the document	13-02	27-02
Request feedback from the teacher	01–03	03-03
Request feedback from the company	07-03	09-03
Sub question 1	**13-02**	**17-03**
Interview with the company	13-02	19-02
measuring and analyzing order and return data.	13-03	17-03
Sub question 2	**13-03**	**26-03**
Exploratory Data Analysis	**13-03**	**26-03**
Data analytics	20-03	26-03
Sub question 3	**27-03**	**16-04**
Literature Study research "why people are returning their shoes."	27-03	07-03
Data Analytics gain insights by measuring and analysing order and return data.	13-03	20-03
Data quality we can find some errors in the data that we need to filter out.	24-03	01-04
Data Preparation	**01-04**	**16-04**
Sub question 4	**12-04**	**12-05**
Testing the trained model.	12-4	19-04
Poster	20-04	23-04
Make the poster	20-04	23-04
Translate the Machine Learning models to communicate them to the stakeholders and validate them.	26-04	12-05
Sub question 5	20-04	17-06
Presentation	17-06	23-06

Communication

Effective communication with the company is crucial for the success of the project. Our team understands the importance of clear and timely communication throughout the project's duration.

Our proposed approach is to deliver the project in sprints, and at the end of each sprint, we will contact the company to provide an update on the progress made. During this contact, we will discuss any issues, concerns, or questions that may have arisen during the sprint. This approach will allow us to stay on track and address any potential problems early on in the project's lifecycle.

The designated contact persons within the company are Frank van Krieken and Bas Roozen. Our project group's contact person is Rick de Rijk. If we require any assistance or guidance, Rick de Rijk will contact Frank van Krieken and Bas Roozen via email to address the issue promptly. We understand the importance of effective communication and will respond to any inquiries or requests for assistance within a reasonable time frame.

If the company has any questions or concerns during the project's duration, they can email our team. We commit to responding to any queries within three working days. This response time is to ensure that the company receives prompt and adequate feedback and support from our team.

In summary, effective communication is essential for the success of the project. Our team commits to keeping the company informed of the project's progress, addressing any concerns or issues that may arise, and responding to any inquiries within a reasonable time frame. We believe that open and transparent communication will create a mutually beneficial and successful project outcome.

Conclusion

In conclusion, reducing product returns can have a significant impact on Van Gastel Shoes' profitability and help the company achieve its goal of reducing its carbon footprint. By using AI to analyze the order and return data, we can identify patterns and trends in customer behavior and develop a customized strategy to reduce returns. Our sub-questions focus on understanding the relationship between order data and return behavior, identifying the main characteristics of returned shoes, determining the most relevant product data for predicting and reducing returns, training machine learning algorithms to predict returns, and addressing the challenges and limitations associated with using AI to reduce product returns. Our research methods include interviews, data analytics, literature study, data quality check, model evaluation and validation, pitching, and prototyping. By leveraging these methods and insights, we aim to develop effective solutions to reduce returns and increase Van Gastel Shoes' profitability while also reducing the carbon footprint associated with product returns.