Fontys
University of Applied Sciences

BUSINESS PROPOSAL

Prepared For
GREENZONE GMBH

Prepared By
NOAH JANSSENS - ERALP KURDAS - DAI SONG

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Domain understanding

Company Background

GreenZone GmbH is a German company that supplies cut flowers, green plants, potted plants, and floral accessories to florists. Founded by Loe Rutten in 2005, the company has built a presence in the floral industry. Recognizing the growing need for digital solutions, GreenZone launched its online shop in 2010, allowing florists in Germany and Austria to easily browse and purchase products online.

The company offers a diverse selection of floral products sourced from various growers and suppliers, ensuring a wide range of options to meet different customer needs. Orders for in-stock items are available for next-day delivery, helping florists maintain fresh inventory without delays. GreenZone operates with a dedicated team of professionals specializing in procurement, logistics, and customer service to ensure seamless operations.

By blending traditional floral distribution with modern technology, GreenZone aims to simplify the purchasing experience for florists. The company continues to evolve with industry trends, offering solutions that enhance accessibility and efficiency for its customers (Greenzone, 2025).

The problem

Greenzone has been working towards a data-driven approach, but the integration of AI in inventory management and forecasting is still incomplete. A Qlik Sense environment was already created for Fontys AI students, but it hasn't been fully utilized. Now, a combined AI & Business project will work together using this environment to improve decision-making for Purchasing, Sales, and Marketing.

Main challenges Greenzone faces:

- Qlik Sense integration is not yet implemented – The AI model from the previous group has been developed, but it's not yet linked to Qlik Sense, making it inaccessible for practical use in purchasing and sales.
- External data is missing – To improve predictions, the AI model needs more data sources, such as seasonal trends, weather, and competitor sales data.
- Market comparison is lacking – Right now, Greenzone's sales are not benchmarked against the broader German flower industry, making it hard to see how they are performing compared to competitors.

- Different project roles need clear integration – The Business team focuses on analyzing values, while the AI team works on predictions, and these need to work together efficiently.
- Data access must be set up correctly – The new student group needs access to sales data in Qlik Sense, but without modifying the original data.

The previous Fontys AI group developed a first version of an AI model but did not implement it in Qlik Sense. This project will take their work further by integrating and refining the model, adding relevant external data, and making it usable in a dashboard format for purchasing and marketing teams.

Requirements, Assumptions and Constraints

Requirements

The project requires access to historical sales and inventory data within Qlik Sense to analyze trends and train the AI model. Additionally, the model must be expanded with external data sources, such as weather conditions, seasonal demand fluctuations, and competitor market trends, to improve accuracy. The final AI model must be integrated into a user-friendly dashboard within Qlik Sense, ensuring that purchasing, sales, and marketing teams can easily interpret and use the predictions. Since we are working on the project, we will have read-only access to the data, all analysis must be performed in a separate environment without modifying Greenzone's operational datasets.

Assumptions

This project assumes that historical sales data is accurate and representative of future trends, allowing the AI model to make reliable predictions. It is also assumed that external data sources (such as weather reports and market trends) will be accessible and relevant for forecasting flower demand. Additionally, it is expected that Greenzone's business processes will remain stable, meaning that no major operational changes will occur during the project that could affect the data or forecasting needs.

Constraints

The project must be completed within one semester, meaning that development and testing time is limited. Another constraint is that not all market data may be freely available, which could limit the extent to which Greenzone's performance can be benchmarked against the broader flower industry. The technical limitations of Qlik Sense may also impact how AI model predictions are displayed and accessed by stakeholders. Finally, since the project team has restricted access to Greenzone's live systems, all implementation must be carefully managed within the designated student environment.

Research Questions

Research question

How can Greenzone optimize their inventory management and marketing by implementing an AI-driven system that reveals sales trends and seasonal patterns, to buy more efficiently and market in a more targeted way?

Sub questions

Understanding the Current State & Business Needs

1. How are Greenzone's current inventory management and marketing strategies structured?
2. What factors most significantly influence sales trends and seasonal patterns in the flower industry?
3. Which machine learning model(s) be used to improve Greenzone's inventory management and marketing strategy?
4. What are the risks and challenges of implementing an AI-driven system at Greenzone?

Project Details

Goal of the project

The goal of this project is to integrate and refine Greenzone's AI forecasting model within Qlik Sense, making it a practical and accessible tool for purchasing, sales, and marketing teams. The AI model, originally developed by a previous Fontys student group, exists but has not yet been implemented into the company's working systems. This project will take the next step by ensuring the model is properly linked to Qlik Sense and that its predictions can be used for real decision-making.

One of the key improvements is the expansion of data sources. The AI model currently works with historical sales data, but to make predictions more reliable, additional external data will be integrated. This includes seasonal trends, weather patterns, holidays, and market trends in the German flower industry. By incorporating these factors, Greenzone can better anticipate customer demand and optimize its stock management.

A second key objective is to compare Greenzone's sales performance with the broader German flower industry. Currently, purchasing decisions are made based on internal sales data, but without benchmarking against competitors, there is no way to determine how well Greenzone is performing in the market. Part of this project involves finding and integrating relevant industry data so that Greenzone can compare its sales trends against the larger flower sector.

Lastly, the project aims to develop a clear and functional dashboard within Qlik Sense. The AI model is only useful if employees can easily interpret its predictions and apply them to their decision-making.

Scope of the project

In scope	Out of scope
Developing an AI model that can be integrated in the current framework	Adding additional nice-to-have features that come up during the project
Adding external data sources, such as weather data.	A 100% bug-free dashboard integration
Delivering a research report which highlights the model's performance and limitations	Offering maintenance and support after the project's deadline has passed

Deliverable Products

The project will deliver at the end of the semester several key outcomes that support Greenzone's goal of implementing AI-driven forecasting in Qlik Sense.

- **AI-Based Sales Predictions**: We will apply an existing forecasting model to Greenzone's sales data. This model will be refined with additional external sources such as weather patterns, holidays, and market trends to improve prediction accuracy. The goal is to provide better demand predictions that help with stock management and planning.
- **Qlik Sense Dashboard Integration**: The forecasts will be integrated into a dashboard within Qlik Sense, making it easy for purchasing, sales, and marketing teams to use the insights for decision-making.
- **Research Document**: Throughout the semester we will keep a research document that tracks our findings, analysis, and answers to the research questions. This document will be updated regularly as we refine the model and integrate new data sources.
- **Business Proposal**: This document outlines the project's background, objectives, and approach. It serves as the starting point for Greenzone to understand the project scope and what we aim to achieve.
- **Final Report**: A report will be delivered that documents the research process, model selection and adjustments, implementation in Qlik Sense, and final recommendations for Greenzone. This report will also include an evaluation of how useful the predictions were in practice and suggestions for improvements.

Approach

With the knowledge we have now and what we will develop throughout the semester, our goal is to expand and implement the AI forecasting model in a way that adds real value to Greenzone. We will start by reviewing the existing AI model and determining how it can be integrated into Qlik Sense while ensuring it provides useful insights for purchasing, sales, and marketing decisions.

A key part of this project is identifying and incorporating external data sources that can improve the accuracy of demand forecasting. This includes weather patterns, seasonal trends, regional holidays, and market insights from the broader German flower industry. By combining these external factors with Greenzone's historical sales data, we can refine the model, so it better predicts customer demand and supports stock management decisions.

We will also focus on choosing the right AI model that best fits Greenzone's needs. While an initial forecasting model has already been developed, we will evaluate whether improvements can be made or if alternative models provide more reliable results. The goal is not just to make accurate predictions but to ensure that the results are interpretable and easy to apply in daily operations.

Once the model is improved and connected to Qlik Sense, we will develop a clear and practical dashboard where users can access AI-driven insights. This dashboard must be user-friendly, allowing employees to quickly see trends, make informed purchasing decisions, and adjust their marketing strategies based on predicted demand.

Finally, the project will include testing and feedback sessions with Greenzone stakeholders to ensure that the AI model and dashboard are useful in practice. The project will conclude with a final report and recommendations on how Greenzone can continue improving its data-driven decision-making beyond this semester.

Planning

Project Planning – AI-Advanced Semester Project

Week	Phase	Tasks	Deliverables
Week 1	**Kickoff & Team Formation**	- Understand project goals & expectations - Form teams and assign roles - Explore potential datasets	Team structure & initial understanding
Weeks 2-4	**Phase 1: Business Proposal**	- Define business objectives & problem statement - Conduct initial exploratory data analysis (EDA) - Identify required data sources - Draft project proposal	**Business Proposal + EDA Report**
Weeks 4-6	**Phase 2: Data Quality (Iteration 1)**	- Collect and clean data - Handle missing values, inconsistencies - Perform feature engineering - Assess data sufficiency & identify gaps	**Data Quality Report**
Weeks 6-10	**Phase 3: Machine Learning & Reporting (Iteration 1)**	- Train initial models - Evaluate model performance - Identify issues & improvements - Refine the model - Prepare conference poster	**Preliminary Model + Conference Poster**
Week 11	**Showroom Presentation**	- Present project to audience (PiI, AI teachers, peers) - Gather feedback for iteration 2	**Conference Poster Presentation**
Weeks 11-13	**Phase 2: Data Quality (Iteration 2)**	- Incorporate feedback from iteration 1 - Collect additional/improved data - Improve feature selection & preprocessing	**Updated Data Quality Report**
Weeks 13-16	**Phase 3: Machine Learning & Reporting (Iteration 2)**	- Retrain model with improved data - Optimize and fine-tune performance - Evaluate improvements over first iteration	**Final Machine Learning Model + Performance Report**
Weeks 16-18	**Final Presentation & Paper Submission**	- Prepare a demo/pitch for Innovation Insights event - Write a 2-page paper summarizing results - Deliver final presentation	**Demo/Pitch + 2-Page Paper**

Group roles

Our group consists of three Advanced AI students—Eralp Kurdas, Dai Song, and Noah Janssens—each bringing specialized expertise in artificial intelligence, machine learning, and data analysis. While we are working on our own AI-focused assignment, we will be collaborating closely with the Advanced Business group, which is undertaking its own project. This partnership will allow us to align technical advancements with strategic business goals, ensuring a well-rounded and impactful outcome for Greenzone.

Additionally, our Advanced AI group is part of a larger group of students, a mini company called ‘Fortifai’, tackling multiple projects for various companies. This structure provides valuable opportunities for cross-project collaboration, knowledge sharing, and technical support. By leveraging insights from our peers working on different industry challenges, we can enhance the effectiveness and adaptability of our AI solutions.

Through this collaborative and interdisciplinary approach, we aim to deliver an AI-driven solution tailored to Greenzone’s needs, while also contributing to the broader ecosystem of innovation within our program.

For this project Noah will be taking on the role as group leader, with Dai and Eralp focusing on developing.

Data understanding

Data Sourcing

For this project the data is delivered by Avanti Data, an intermediary for al GreenZone's data needs. The current form of data delivery is not optimal, receiving the source file with all the necessary data has not yet happened, instead we received access to the Qlik dashboard where this data is integrated to make visuals and gather insights for GreenZone. At the time of writing (13-03-2025) we are working with Avanti Data to get some form of the source file available to build on, because in its current state, building a prediction model is very limited.

Data Exploration

To properly perform a data exploration for Greenzone, we require the complete raw dataset regarding sales and geographical data. Fortunately, we do have access to some of this data. For example, type of flowers, sale amount, suppliers, etc. (For reference see the snippet below).

However, this data is currently not in the ideal format, thus transformations to the data must be done. An example of one of these transformations would be the addition of geographical data. This will have to be further examined within the next few weeks.

Since there are no primary and foreign keys available, we will have to stick to the main dataset 'Verkoop vergelijkoverzicht'.

Artnr	Artikel	S1	S2	S3	2023 Inkoop	2023 Verkoop	2023 Marge	2023 Marge %	2023 Stelen	2023 Bossen	2023 Gem. Kaleprijs
Totalen					**€ 9.558.889,60**	**€ 13.656.237,05**	**€ 4.097.347,45**	**42,86%**	**16.343.277**	**2.154.291**	**€ 0,51**
105432	- Chamaecyparis Lawsoniana Blau De Luxe	50	0	0	€ 15,50	€ 20,70	€ 5,20	33,55%		10	€ 1,55
105436	- Chamaecyparis Pisifera Filifera	50	0	0	€ 18,60	€ 25,00	€ 6,40	34,41%		10	€ 1,86
119601	- Cham Juniperus Wacholder	50	400	0	€ 52,50	€ 66,00	€ 13,50	25,71%		15	€ 3,50
119601	- Cham Juniperus Wacholder	50	400	0	€ 17,50	€ 22,60	€ 5,10	29,14%		5	€ 3,50
119835	- Chamaecyparis Lawsoniana Nana Aurea	20	0	0	€ 20,90	€ 27,20	€ 6,30	30,14%		10	€ 2,09
1995	- Euphorbia Spinosa	60	300	0	€ 22,50	€ 30,20	€ 7,70	34,22%		10	€ 2,25
104397	- Oliven Gruen 300 Gram	60	300	0	€ 7,25	€ 11,70	€ 4,45	61,38%		5	€ 1,45
104397	- Oliven Gruen 400 Gram	60	400	0	€ 9,25	€ 11,70	€ 2,45	26,49%		5	€ 1,85
17243	Astrantia Rosa Lee	40	0	23	€ 22,40	€ 47,00	€ 24,60	109,82%	100		€ 0,21
23102	Chr San Jeanny Pink	55	110	23	€ 5,75	€ 10,75	€ 5,00	86,96%	25		€ 0,22
122278	Di Barb Kiwi Mellow	40	0	23	€ 15,00	€ 33,50	€ 18,50	123,33%	50		€ 0,30
111887	Di St Zurigo	70	0	23	€ 29,44	€ 60,00	€ 30,56	103,80%	80		€ 0,33
114859	Dianthus St Lege Marrone	60	0	23	€ 6,20	€ 11,80	€ 5,60	90,32%	20		€ 0,31
118283	Di St Maruchi	60	0	23	€ 7,60	€ 14,60	€ 7,00	92,11%	20		€ 0,36
123839	Di St Copper Extasis	65	0	23	€ 11,60	€ 23,60	€ 12,00	103,45%	40		€ 0,29
12398	Di Tr Chateau	65	35	23	€ 18,70	€ 36,50	€ 17,80	95,19%	50		€ 0,36

Data Description

Column Name	Type	Category	Description
Bestellijst of voorraad	String	Categorical	Order list of stock
Debnmr	Hashed	Numerical	Number ID of the debtor
Debiteur	Hashed	Categorical	Name of the debtor
Week	Integer	Numerical	Number of the week
Artikelgroep	String	Categorical	Label of the flower type
Hoofdproductgroep	String	Categorical	Main segment of the flowers
Productgroep	String	Categorical	Sub segment of the flowers
Kweker	String	Categorical	Grower of the flowers
Leverancier	String	Categorical	Supplier of the flowers
Artnr	Integer	Numerical	Number of the label of the flower type
Artikel	String	Categorical	Sub subsegment of the flowers
S1	Integer	Numerical	?
S2	Integer	Numerical	?
S3	Integer	Numerical	?
20xx Inkoop	Integer	Numerical	Purchase of the year 20xx
20xx Verkoop	Integer	Numerical	Sales of the year 20xx
20xx Marge	Integer	Numerical	Marge of the year 20xx
20xx Marge %	Integer	Numerical	Marge in % of the year 20xx
20xx Stelen	Integer	Numerical	Pieces of flower in the year 20xx
20xx Bossen	Integer	Numerical	Bundle of flower in in the year 20xx
20xx Gem. Kaleprijs	Integer	Numerical	Average price without tax in year 20xx

Gem. Kaleprijs	Integer	Numerical	Average price without tax
Gem. Kaleprijs verschil	Integer	Numerical	Average of the difference of the prices without tax
20xx Gem. Verkprijs	Integer	Numerical	Average sales price of the year 20xx
Gem. Verkprijs	Integer	Numerical	Average sales price
Gem. Verkprijs verschil	Integer	Numerical	Difference of the average sales price

Bibliography

Greenzone. (2025). *This is who we are!* Retrieved from https://greenzone-blumen.de/en/who-are-we/