

**AI-Based Assistant for Personalized Meal Planning Recommendations, Grocery Management, and Dietary Monitoring**

Bachelor Thesis

Bachelor of Science

Business Informatics – Data Science

at the

Dualen Hochschule Baden-Württemberg Lörrach

Eunice Stacy Tiolamon

28. Juli 2025

|  |  |
| --- | --- |
| Degree course | WDS22A |
| Training company | Jedox GmbH, Freiburg im Breisgau |
| Supervisor at the training company | AlbertoPerandones |
| Scientific supervisor | Klemens Schnattinger |

Declaration on honour

I hereby certify that I have written my bachelor thesis (or project paper or seminar paper) with the topic:

AI-Based Assistant for Personalized Meal Planning Recommendations, Grocery Management, and Dietary Monitoring

and that I have not used any sources or aids other than those indicated. I also certify that the submitted electronic version is identical to the printed version.

Freiburg, 28. Juli 2025



Eunice Stacy Tiolamon

Length of this paper

The text part of the present work - beginning with the introduction and excluding the list of sources - includes Anzahl Seiten pages.

Statement of Approval

This thesis has been reviewed by the training company

Jedox GmbH, Freiburg im Breisgau, and approved for submission to the DHBW Lörrach, study program Business Informatics - Data Science.

Freiburg im Breisgau, 28. Juli 2025 Signature of company representative

Abstract

…

Table of Contents

[Declaration on honour I](#_Toc198626386)

[Length of this paper II](#_Toc198626387)

[Statement of Approval III](#_Toc198626388)

[Abstract IV](#_Toc198626389)

[Table of Contents V](#_Toc198626390)

[List of Abbreviation VII](#_Toc198626391)

[List of Figures VIII](#_Toc198626392)

[1 Introduction 1](#_Toc198626393)

[1.1 Motivation 1](#_Toc198626394)

[1.2 Problem Definition and Problem Delimitation 1](#_Toc198626395)

[1.2.1 Problem Definition (Data Preparation) 1](#_Toc198626396)

[1.2.2 Problem Delimitation 1](#_Toc198626397)

[1.3 Aim of Work 1](#_Toc198626398)

[1.4 Methodology or Materials and Methods 1](#_Toc198626399)

[1.4.1 Structured Literature Review 1](#_Toc198626400)

[1.4.2 … 1](#_Toc198626401)

[2 Conceptual Basics 2](#_Toc198626402)

[2.1 Machine Learning 2](#_Toc198626403)

[2.2 2](#_Toc198626404)

[3 Actual State and Problem Analysis 3](#_Toc198626405)

[3.1 Literature Findings 3](#_Toc198626406)

[3.2 … 3](#_Toc198626407)

[3.3 … 3](#_Toc198626408)

[3.4 Actual Analysis 3](#_Toc198626409)

[3.5 Problem Analysis and Requirements Analysis 3](#_Toc198626410)

[4 Solution Concept 4](#_Toc198626411)

[4.1 Skills and Training 4](#_Toc198626412)

[4.2 Education 4](#_Toc198626413)

[5 Implementation 5](#_Toc198626414)

[6 Conclusion 6](#_Toc198626415)

[References VII](#_Toc198626416)

List of Abbreviation

* …

List of Figures

Figure 1: …

# Introduction

## Motivation

…

## Problem Definition and Problem Delimitation

### Problem Definition (Data Preparation)

…

### Problem Delimitation

…

## Aim of Work

…

## Methodology and Structure

### Structured Literature Review

…

### …

…

# Conceptual Basics

## Machine Learning

…

## 

…

# Status Quo and Problem Analysis

## Literature Findings

…

## Existing Solutions in Personalized Nutrition Assistant

### User Requirements

…

### Market Gaps

…

## Problem Analysis

…

## Requirements Analysis

…

# Solution Concept

## Systen Architecture of the AI-Based Assistant

…

## Recommendation Engine for Personalized Meal Plans

…

## Grocery & Inventory Tracking Concept

…

## Dietary Monitoring Module Design

…

…

# Implementation

## Technologies Used

…

## Data Pipeline & Preprocessing Implementation

…

## Meal Recommendation Module

…

## Grocery & Inventory Management System

…

## Evaluation of Implementation and Initial Results

…

# Conclusion

## Summary of Results

…

## Critical Reflection on Methods and Outcomes

…

## Limitations

…

## Outlook and Future Enhancements

…

References

*…*