

Abschlussarbeit: *Retrieval-Augmented Generation-Based Agent for Product Manual Q&A in Customer Support*

alternative title:

- **An RAG-Driven Knowledge Retrieval Agent for Enterprise Product Manuals: Design, Prototype and Evaluation**

Category

1. Introduction

- 1.1 Research Background and Motivation
- 1.2 Research Objectives and Contributions
- 1.3 Thesis Structure Overview

2. Methodology

- 2.1 Systematic Literature Review
 - 2.1.1 Search Strategy and Databases
 - 2.1.2 Inclusion/Exclusion and Quality Assessment Criteria
 - 2.1.3 Data Extraction and Synthesis Process
- 2.2 Prototype Design and Evaluation
 - 2.2.1 Prototype Development Workflow
 - 2.2.2 Evaluation Metrics and Experimental Design
 - 2.2.3 User Testing and Feedback Collection

Part I: Theory and Best Practices

3. Foundations of Retrieval-Augmented Generation (RAG)

- 3.1 Concept and Evolution of RAG
- 3.2 Core Components: Retriever and Generator
- 3.3 Comparison of Major RAG Architectures
- 3.4 Advantages and Limitations

4. Overview of Intelligent Agent Technology

- 4.1 Definitions and Classifications
- 4.2 LLM-Based Agent Workflows
- 4.3 Representative Platforms and Frameworks

5. Differences, Overlaps, and Synergies between RAG and Agents

- 5.1 Technical Boundaries: RAG vs. Agent
- 5.2 Synergy Models: How RAG Enhances Agent Knowledge
- 5.3 End-to-End Implementation Comparisons

6. Enterprise Application Scenarios and Value of RAG-Agents

- 6.1 Customer Service Scenarios
 - 6.1.1 FAQ Auto-Answering
 - 6.1.2 Ticket Triage and Response
- 6.2 Sales and Marketing Scenarios
 - 6.2.1 Lead Scoring and Prioritization
 - 6.2.2 Personalized Recommendations
- 6.3 Decision Support Scenarios
 - 6.3.1 Explainable Analytics Dashboards

8. Case Selection and Requirements Analysis

- 8.1 Characteristics of the Enterprise Product Manuals
- 8.2 Use-Case Definition (e.g., Customer Support Q&A)
- 8.3 Functional and Non-Functional Requirements

9. System Architecture and Design

- 9.1 Overall Architecture Diagram
- 9.2 Module Breakdown
 - 9.2.1 Document Preprocessing
 - 9.2.2 Embedding and Retrieval Module
 - 9.2.3 Generation Module
 - 9.2.4 Human-Machine Interface

10. Prototype Implementation

- 10.1 Technology Stack and Tools
- 10.2 Key Algorithms and Parameter Settings
- 10.3 Deployment and Runtime Environment

11. Evaluation Design and Experimental Setup

- 11.1 Evaluation Metrics (Recall, Precision, User Satisfaction, etc.)
- 11.2 Test Dataset and Query Construction
- 11.3 User Testing Process and Survey(interview) Design

12. Results and Analysis

- 12.1 Quantitative Results and Comparisons
- 12.2 Qualitative User Feedback and Interview Insights
- 12.3 Discussion against Defined Objectives
- 12.4 Limitations and Opportunities for Improvement

13. Conclusion and Future Work

- 13.1 Review of Contributions
- 13.2 Recommendations for Enterprise Adoption
- 13.3 Directions for Further Research

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