



AIS: A Web Based Product Management System for Personalized Product Recommendation

UNDERGRADUATE THESIS
Submitted as one of the requirements to obtain
Sarjana Komputer (S.Kom.)

By:
Aditya Hadi Nugraha
001202200032

FACULTY OF COMPUTER SCIENCE
INFORMATICS STUDY PROGRAM
CIKARANG
AUGUST, 2025

SIMILARITY INDEX REPORT

AIS: A Web Based Product Management System for Personalized Product Recommendation

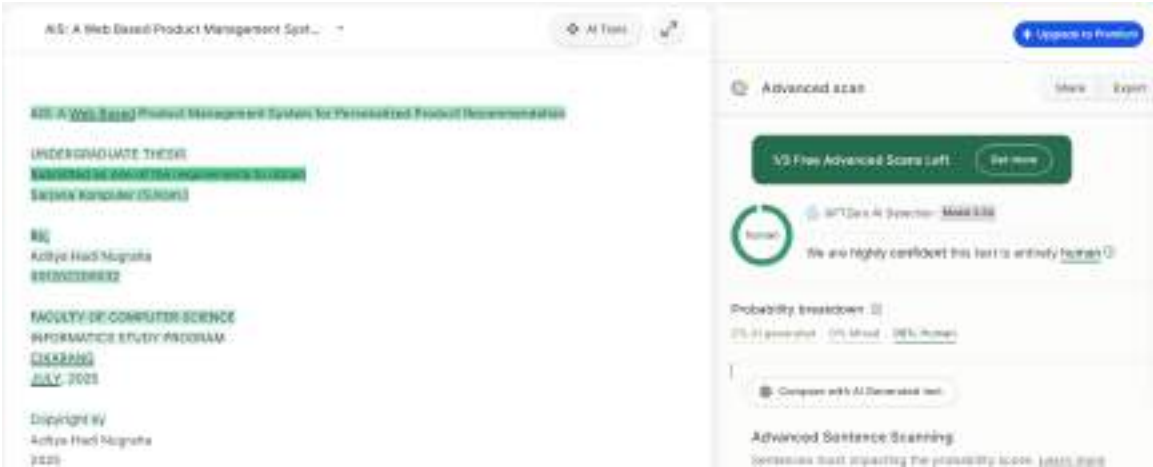
ORIGINALITY REPORT

2%	1%	0%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.centurycouncil.org Internet Source	<1%
2	nano-ntp.com Internet Source	<1%
3	mssi.nrs.gov.bc.ca Internet Source	<1%
4	Submitted to Asia Pacific University College of Technology and Innovation (UCTI) Student Paper	<1%
5	esj.eastasouth-institute.com Internet Source	<1%
6	smalibusinessappdevelopme20276.bluxeblog.com Internet Source	<1%
7	Oussama Wali, Mohamed Saifeddine Hadj Sassi. "chapter 1 Data Science and Business Intelligence Transforming Insights Into Action", IGI Global, 2025 Publication	<1%
8	dspace.bracu.ac.bd:8080 Internet Source	<1%

SCREENSHOT OF ZEROGPT



ABSTRACT

After-sales service plays a vital role in customer satisfaction and long-term business success, yet many organizations struggle with efficiently managing product-related data and delivering personalized support. In the automotive and retail sectors, customers often face challenges in finding the right spare parts or follow-up products based on their past purchases. Existing systems typically lack intelligent recommendation features and centralized management, which hinders customer engagement and limits business insights.

To address these issues, this project introduces AIS (After Sales Information System), a web-based product management platform designed to enhance the post-purchase customer experience through personalized product recommendations. The system integrates transactional data processing with a collaborative filtering algorithm to recommend relevant spare parts or follow-up items tailored to each customer's purchase history. AIS also includes a streamlined interface for managing product information, sales data, and customer profiles, ensuring centralized control and improved decision-making.

Key features of AIS include structured product categorization, a hybrid recommendation engine that combines collaborative and content-based logic, and evaluation metrics to track algorithm accuracy. By offering intelligent suggestions and simplifying data management, AIS aims to increase customer retention, optimize inventory usage, and support data-driven after-sales strategies.

Ultimately, this platform bridges the gap between product usage and post-sale engagement, empowering businesses to deliver proactive, personalized service while unlocking valuable insights from customer behavior.

Keywords: *Product Management System, Personalized Recommendation , Web-Based Application, User Behaviour, Recommendation Engine, Content-Based Filtering.*

TABLE OF CONTENTS

	Page
STATEMENT OF ORIGINALITY	1
SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST	1
ADVISOR APPROVAL FOR JOURNAL/INSTITUTION’S REPOSITORY	3
SIMILARITY INDEX REPORT	4
SCREENSHOT OF ZEROGPT	5
ABSTRACT	6
DEDICATION	7
ACKNOWLEDGMENTS	7
TABLE OF CONTENTS	10
INTRODUCTION	13
I.1 PROBLEM FORMULATION	13
I.1.1 Background of the Problem	13
I.1.2 Problem Statement	15
I.1.3 Objectives	15
I.1.4 Problem from a Customer Perspective	16
I.2 PROBLEM CONSTRAINT ANALYSIS	17
I.2.1 Aspect 1: Economics	17
I.2.2 Aspect 2: Technological Feasibility	18
I.2.3 Aspect 3: User Experience	19
I.3 PROBLEM FUNCTIONAL ANALYSIS	20
I.3.1 Functionalities 1: Personalized Product Recommendation Engine	20
I.3.2 Functionalities 2: User-Friendly Dashboard	20
I.3.3 Functionalities 3: Data Analytics and Insight	20
I.4 SOLUTION SELECTION	21
I.4.1 Alternative Solution 1: Customer Relationship Management	21
I.4.2 Alternative Solution 2: Product Management System	21
I.4.3 Alternative Solution 3: Sales and Inventory System	22
I.5 SOLUTION USAGE SCENARIOS	23
I.5.1 Scenario of Personalized Product Management System	23
I.6 DEVELOPMENT EFFORT	25

I.6.1 Man-months	25
I.6.2 Machine-months	25
I.6.3 Development tools	25
I.6.4 Test Equipment	25
I.6.5 Expert needs	26
I.6.6 Cost estimation	26
I.6.7 Timelines	26
METHODOLOGY	29
II.1 System Architecture	30
II.2 Product Recommendation Handling Logic	32
II.3 Tools and Technologies	36
IMPLEMENTATION	39
III.1 Product Recommendation Database Implementation	39
III.2 Recommendation Engine Design Implementation	41
III.3 User Interface Implementation	45
TESTING	47
IV.1 Functional Testing	47
IV.2 Non-functional Specifications Validation	48
RESULT AND DISCUSSION	49
I.1 Result	49
I.1.1 Effectiveness of product recommendation engine	50
I.1.2 Effectiveness of Invoice email reminder system	50
I.2 Discussion	51
I.2.1 The Role of After Sales Information System (AIS) in Personalized Product Recommendations	52
I.2.2 Outstanding Invoice Reminder System for Transaction Transparency	53
I.3 User Expectations and Ethical Considerations	53
I.4 Future Enhancements	55
CONCLUSION	58
REFERENCES	59