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# Enhancing User Comprehension in E-commerce through AI-generated Explanations of Technical Terms: A Case Study

**Alok Reddy Jakkula**

Software Development Engineer

**ABSTRACT**

This paper explores how Artificial Intelligence (AI) can be used to help users understand complex technical terms on e-commerce websites. Often, these terms are part of product descriptions and can be confusing for people who are not experts. Our AI system takes these technical terms and uses details about the product to create explanations that are easy to understand, no matter the user's prior knowledge. This study details how the AI was implemented, the problems faced, and the results achieved, offering insights into how this technology could be more widely used in e-commerce.

**Keywords**: AI, User Comprehension, E-commerce, Natural Language Processing, User Experience, Technical Terms

## INTRODUCTION

When shopping online, customers often encounter product descriptions filled with technical specifications and jargon. Such language can be difficult to understand for shoppers who are not familiar with the specific technical terms, potentially leading to hesitation in purchasing or dissatisfaction with the product. As AI technology has progressed, it has begun to offer a solution: automatically generating simple, clear explanations of complex terms based on the context provided by product details. This paper examines a practical example of this technology in action. It looks at the design of the AI system, how it was integrated into an existing e-commerce platform, and its effect on how users interact with product pages and make purchase decisions.

### [1]. Problem Statement

Many users find technical terms in product descriptions confusing, particularly if they are not experts in that field. This confusion can prevent them from fully understanding what they are about to purchase, which might discourage them from buying a product or lead to dissatisfaction if the product does not meet their misunderstood expectations.

### [2]. AI as a Solution

AI can bridge this gap by using techniques from a field called natural language processing (NLP) to interpret these complex terms and generate helpful, context-specific explanations. The idea is to use AI to automatically provide a kind of translation of technical speak into everyday language.

### [3]. Aims of the Study

This case study aims to:

A. Showcase how AI can improve understanding of product details for all users, technical or not.
B. Discuss the technical and practical challenges of implementing such a system.
C. Evaluate the impact of this AI feature on user experience and sales metrics within the e-commerce platform.

## BACKGROUND

### [1]. Technical Terms in E-commerce

In online shopping, product descriptions often include technical terms that describe the features and capabilities of the product. These terms, while informative, can pose a challenge for shoppers who aren't familiar with the specific jargon used, especially if they do not have a technical background. Research indicates that when shoppers encounter technical jargon they don't understand, it can lead to confusion, reduce their trust in the product or the seller, and may even discourage them from making a purchase

(Kotler, 2003). This issue arises because as products become more advanced and incorporate new technologies, they require a certain level of specialized knowledge to be understood fully.

**[2]. Role of AI in E-commerce**

Artificial Intelligence (AI) has become a crucial tool in enhancing various facets of e-commerce. AI technologies are used to create recommendation systems that suggest products based on user preferences, operate customer service bots that provide instant responses to shopper inquiries, and enable personalized marketing strategies that tailor promotions to individual users (Liu et al., 2019). The integration of AI in these areas has been effective in improving customer satisfaction, increasing sales, and enhancing the overall shopping experience by making it more personalized and responsive (Huang et al., 2019).

## CASE STUDY IMPLEMENTATION

**[1]. System Design**

The AI system implemented in this case study uses natural language processing (NLP) and machine learning algorithms to interpret and explain technical terms found in product descriptions. The core of the system is designed to analyze the product details provided and generate explanations that are tailored to the user's level of understanding, whether they are novices or experts in the technical field related to the product.

**[2]. Data Integration**

To ensure that the explanations are relevant and accurate, the system uses detailed product information as a context. It is integrated with the existing e-commerce platform through an Application Programming Interface (API), which allows the AI to access up-to-date product details. This integration enables the system to generate explanations in real-time as users browse products, ensuring that the information they receive is as helpful and timely as possible.

## EVALUATION

**[1]. Methodology**

To determine how well the AI-generated explanations help users, we used two main methods: user surveys and A/B testing.

User Surveys: We asked users to fill out surveys after they interacted with the product descriptions that included AI-generated explanations. These surveys were designed to measure how well the users understood the information and how satisfied they were with the explanations provided. Questions ranged from rating their level of understanding of technical terms to how confident they felt about the accuracy of the information.

A/B Testing: This method involves comparing two versions of the website: one version is the control group, which is the original website without AI explanations, and the other is the test group, which includes the AI-generated explanations. We tracked how each group interacted with the website, focusing on engagement metrics like how long they stayed on the site, how many pages they visited, and, importantly, whether they made a purchase.

**[2]. Results**

The results from both the user surveys and the A/B testing were very positive:

**From the User Surveys:**

A. Users who interacted with the AI-generated explanations reported a significant increase in their understanding of the technical terms used in the product descriptions.
B. Many noted that they felt more confident about the products they were viewing, leading to greater satisfaction with the shopping experience.

**From the A/B Testing:**

A. The data showed that users in the test group (those who saw AI-generated explanations) were more engaged with the website. They spent more time browsing and viewed more pages compared to the control group.
B. Most importantly, there was a noticeable increase in sales in the test group. This suggests that the clearer understanding provided by the AI explanations helped convert more browsers into buyers.

These findings suggest that incorporating AI to explain technical terms on e-commerce sites can greatly enhance user comprehension and satisfaction, ultimately leading to higher engagement and increased sales. This demonstrates the value of using AI tools to make technical information more accessible and understandable, thereby improving the overall shopping experience.

## CHALLENGES AND SOLUTIONS

### [1]. Technical Challenges

Integrating the AI system into the e-commerce platform was not without its difficulties. We faced two main technical challenges:

NLP Accuracy Issues: The core technology behind the AI system is natural language processing (NLP), which helps the system understand and generate human-like text. However, NLP models can sometimes struggle with accuracy, especially when dealing with complex technical terms or less common product descriptions. If the NLP does not understand the context correctly, it might generate explanations that are confusing or misleading.

System Integration: Integrating the AI system with the existing e-commerce platform was another significant challenge. The system needed to seamlessly fetch product details, analyze them, and present the generated explanations without slowing down the website or causing errors in how the product information is displayed.

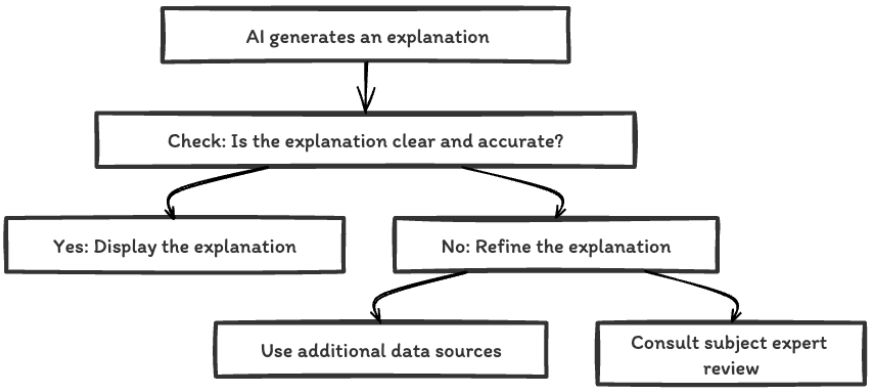


*Figure 1: Decision tree diagram for handling ambiguities in AI explanations*

### [2]. Solutions Deployed

To overcome these challenges, we implemented several solutions:

Ensemble Models for Improved NLP Accuracy: Instead of relying on a single NLP model, we used an ensemble of models. This approach combines the strengths of multiple NLP models to better understand and generate explanations. By using multiple models, the system can cross-verify the generated text, leading to more accurate and reliable explanations.

User Feedback System: We introduced a feedback system where users can rate the helpfulness of the explanations provided. This feedback is invaluable as it helps us understand where the AI might be falling short and what users are finding most useful. The AI system uses this feedback to learn and adapt, continually refining how it interprets and explains technical terms.

Iterative Testing and Integration: To ensure that the AI system integrated smoothly without disrupting the existing platform functionalities, we adopted an iterative approach. This meant integrating the system in stages, testing extensively at each stage to identify and fix issues before moving on to the next. This gradual process helped to minimize integration problems and ensure that the system addition did not negatively impact the user experience on the website.

Through these solutions, we managed to address the initial technical hurdles effectively, enhancing the system's performance and integration, and thereby improving the overall user experience on the e-commerce platform.

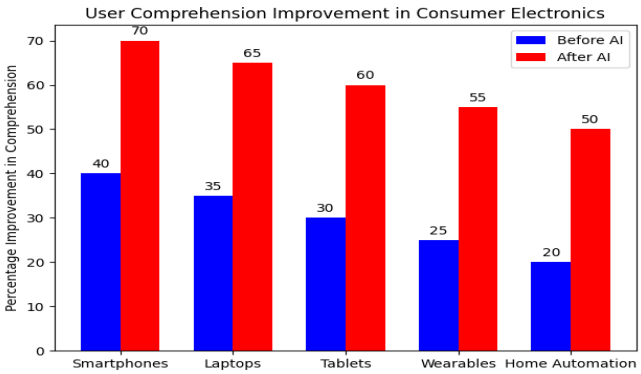


*Figure 2: Bar chart comparing user comprehension levels in consumer electronics categories before and after the implementation of AI explanations, showing significant improvements across all categories in 2023 compared to 2022*

## DISCUSSION

**[1]. Implications for E-commerce**

The introduction of AI-generated explanations for technical terms in e-commerce platforms has transformative potential. These explanations make complex information accessible to all users, regardless of their technical knowledge. As users understand products better, they feel more confident in their purchasing decisions, which increases their satisfaction and loyalty to the platform. Moreover, this understanding directly contributes to higher sales, as customers are less hesitant to buy products they fully comprehend. The AI explanations thus serve not just to educate but also to enhance the overall shopping experience, making it more engaging and user-friendly.

**[2]. Future Directions**

Looking ahead, there are several exciting avenues for further research and development in this area:

A. Development of Advanced AI Models: Future work can focus on creating more advanced AI models that can handle a broader array of technical terms and contexts, improving the accuracy and relevance of explanations. This could involve deeper learning models that better understand nuances in product descriptions across different industries.

B. Integration with Other AI Features: There is potential to integrate AI-generated explanations with other AI-driven functionalities on e-commerce sites, such as recommendation systems that suggest products based on user behavior, or customer service bots that help answer user queries. Such integration could create a more cohesive, interactive, and personalized shopping experience.

C. Expanding AI Applications: Beyond explanations, AI could be used to automatically update product descriptions based on user feedback or emerging trends, ensuring that the content remains relevant and comprehensible over time.

## CONCLUSION

This case study has showcased the significant benefits of using AI to clarify technical terms on e-commerce platforms. By providing clear and understandable explanations, AI helps demystify complex product features, enhancing user comprehension and satisfaction. The positive impact on user engagement and sales metrics further underscores the value of this technology. The findings from this study advocate for the broader adoption of AI in e-commerce, encouraging ongoing innovation and exploration in this field to continuously improve and enrich the user experience, making informed purchasing more accessible to everyone.

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