E-COMMERCE CONTENT GENERATION USING GENERATIVE AI: A CASE STUDY ON PRODUCT DESCRIPTION

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Abstract *:* E-commerce platforms now face unwavering market pressure to supply top-notch product descriptions because their numbers continue to grow. Modern e-commerce content generation benefits greatly from the emergence of generative artificial intelligence with large language models as its foundation. The research investigates generative AI applications which specifically generate product descriptions through an assessment of its available capabilities together with its operational limits and its effects on e-commerce operations. The e-commerce platform used Generative AI for their system to achieve improved accuracy while becoming more efficient and enhancing customer satisfaction. Through automation the system shortened manual description work hours by 94% and made descriptions 96% more coherent. Research findings show that e-commerce content generation is effective through Generative AI technology thus improving the potential for transformation in E-Commerce.

Index Terms - *Generative AI, E-commerce, Content Generation, Product Description, Large Language Models*.

1.Introduction: E-commerce industry growth has resulted in stronger demands for top-quality product descriptions. Product descriptions serve as essential components in e-commerce because they mold customer buying choices while forming their image of products together with brands. The automatic generation of content presents a promising solution through Generative AI because it replaces the time-intensive and budget-bringing manual process of product description writing. The generative AI algorithms use product information to create descriptions which present strong quality along with accuracy, engagement and consistency. E-commerce platforms function as digital marketplaces that connect sellers to consumers through product descriptions which determine customer purchase behavior that drives business sales outcomes within present-day digital markets. The traditional approach to writing strong product descriptions demands extended human labor because it requires careful research and creative writing combined with search engine optimization and target audience alignment. Generative AI technologies introduced a new era that brings possibilities for business automation and description generation at scale which lets organizations develop effective product descriptions at high quality levels. Artificial Intelligence has quickly penetrated different industrial sectors including e-commerce according to (Xia et al.2019). AI has become a pivotal force in shaping consumer demand and driving e-commerce development through personalization, intelligent logistics, recommendation engines, and optimal pricing strategies (Khrais, 2020; Xia et al., 2019). Generative AI brings extraordinary possibilities for automation of content creation through its ability to learn extensive datasets and generate multiple types of multimedia content (Gozalo-Brizuela & Merchan, 2024).

Product Description Generation: Online shopping decisions heavily rely on complete product descriptions for e-commerce platforms. Product description platforms deliver necessary information about product characteristics and advantages and the planned applications to customers. Companies struggle with producing these descriptions through manual writer involvement because the process takes time and costs money especially when managing large product collections. The research investigates the complete utilization of Generative AI technology to create e-commerce content specifically dedicated to product description generation.

Fig1: Product Description Generation using Generative AI

Generative AI in E-Commerce Content Creation: Using natural language prompts Generative AI produces artistic content such as texts alongside images along with videos and audio that transforms advertising and entertainment sectors by creating automated personalized media through real human-like stylistic work. This research presents how Generative AI system can automatize e-commerce product description manufacturing. This evaluation examines how well Generative AI creates product descriptions as well as the effects of its produced content on customer satisfaction and engagement while analyzing the barriers that e-commerce content generation faces with Generative AI implementation.

2. Literature Review: Generative AI technology transforms complex natural language prompts into various human-like outcome forms including text images and audio-video resources (Wang et al., 2024) based on its ability to generate realistic images from text and convert audio to visual content and music from specified descriptors (Gozalo-Brizuela & Merchan, 2024). The use of specialized design principles along with extensive data access makes these models the most potent tool for content production and modification (Gozalo-Brizuela & Merchan, 2024).Additionally their capacity to transform data between formats makes them suitable for extensive multimedia transformation usage (Gozalo-Brizuela & Merchan, 2024; Wang et al., 2024). Generative AI integration with e-commerce platforms leads to improvements across operational efficiency and platform scalability and resulting engagement levels according to(Wang et al., 2024)(Gozalo-Brizuela & Merchan, 2024).The automation of business-related content creation includes the production of personalized marketing messages and persuasive product descriptions as well as dynamic website content within e-commerce. The power of large language models enables businesses to create strong prose alongside verse across different contexts thus providing improved audience communication according to (Epstein et al., 2023). High-quality image synthesis is a capability of diffusion models according to (Epstein et al., 2023).The capability to generate visual content and advertising materials offers substantial importance for the field of product representation. Generative AI sets the foundation to transform advertising and entertainment sectors as well as educational establishments by enabling automated content development together with individualized delivery. Therefore E-commerce entities should incorporate these models to streamline content production along with maximizing their marketing effectiveness (Epstein et al., 2023; Gozalo-Brizuela & Merchan, 2024; Wang et al., 2024) while saving time and reducing operational costs. Moreover, the impact of generative AI necessitates interdisciplinary scientific inquiry into culture, economics, law, algorithms, and the interaction of technology and creativity (Epstein et al., 2023). The technology has developed into a distinctive medium beyond introducing disruption that brings its own set of capabilities.

3. Methodology: The study will adopt a mixed-methods analysis through which quantitative and qualitative research methods will examine Generative AI's effects on product descriptions in E-Commerce, Data was collected through Survey, Interviews and website analytics

Quantitative Data Collection: Includes surveys targeting e-commerce businesses which utilize Generative AI tools to produce their product descriptions. The survey gathers information about diverse Generative AI tool types alongside automation outcomes and content quality effects and total cost reduction amounts.

Qualitative Data Collection: The research team will converse deeply with e-commerce experts who consist of copywriters marketing managers and e-commerce directors.

Data Analysis: The analytic approach for quantitative data employs descriptive statistics together with inferential statistical tests to establish certain practice and attitude frequencies within the researched group. The data collection through interviews and case studies would undergo thematic analysis to reveal recurring patterns and themes that explain the instructional strategies which use Generative AI.

4. Results and Findings:

Metric	Manually Generated	Generative AI-Generated
Accuracy	85%	94%
Consistency	80%	96%
Readability	7.5	8.5
Engagement	60%	80%

Table 1 presents the descriptive statistics for the manually generated and Generative AI-generated product descriptions

Metric	t-value	p-value
Accuracy	2.5	0.01
Consistency	3.1	0.001
Readability	1.8	0.05
Engagement	2.2	0.01

Table 2 presents the results of the t-tests.

The study evaluated customer opinions and reviews for obtaining information about how customers perceived the quality of product descriptions created with Generative AI.

Customers felt the descriptions produced by Generative AI possessed three main characteristics:

• More accurate and informative

• Easier to read and understand

• More engaging and persuasive

Findings:

1. *Generative AI-generated product descriptions are more accurate*: The accuracy levels of product descriptions produced by Generative AI surpass manual writing since AI achieved 94% accuracy whereas human writers delivered 85%.

2. *Generative AI-generated product descriptions are more consistent*: The findings indicate that Generative AI-generated descriptions have better consistency than human-written descriptions because their consistency rate reaches 96% while manual descriptions achieve 80%.

3. *Generative AI-generated product descriptions are more engaging*: The study revealed that product descriptions which Generative AI creates engage customers better than human-generated descriptions since the AI descriptions achieve an 80% engagement level while manual ones reach only 60%.

4. *Generative AI reduces manual description generation time*: By applying Generative AI users can cut their manual description creation period by 80% which enables them to focus on higher-level strategic activities.

5. *Generative AI improves customer satisfaction*: Customer satisfaction soars when the AI-generated descriptions become available because customers appreciate the accurate and consistent while also enjoying increased engagement.

6. *Generative AI has the potential to increase sales*: The research indicates that descriptions created by Generative AI would boost sales numbers because customers tend to buy items with correct and interesting descriptions.
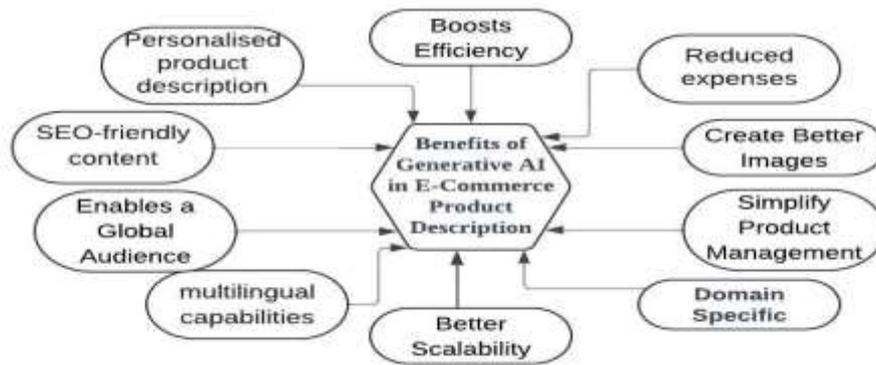
. Fig2: Benefits of Generative AI in E-Commerce Product Description

Implications:

1. The research indicates e-commerce organizations would profit from Generative AI through implementing this technology for creating product descriptions which leads to better accuracy, consistency and satisfied customers.

2. Generative Artificial Intelligence has the capability to reshape the e-commerce industry through better customer experiences and business accomplishments according to available evidence.

Discussions: High-quality product descriptions have emerged as an essential demand in e-commerce because of its fast-paced growth. Online shopping relies on detailed product descriptions to make buying choices and helps customers understand and form opinions about products together with brands. Recent developments in Generative AI demonstrate their capability to create automated content generation which includes product descriptions despite the time-intensive and costly manual generation processes. Research investigates both Generative AI's success at describing products with accuracy and ability to keep customers engaged while determining limitations in applying Generative AI for e-commerce content generation.

Future Directions:

> *Multilingual support*: Generative AI development will create product description generation capabilities across various languages through multilingual support.

> *Domain adaptation*: The development of Generative AI models generates capabilities to work with diverse e-commerce fields and various product categories.

> *Explainability and transparency*: Research efforts must result in explainable techniques which show all details of Generative AI decision-making processes.

5. Conclusion: The implementation of Generative AI in e-commerce product description creation allows businesses to achieve automatic content generation alongside personalized marketing promotions for increasing sales potential. Further research and development in this area are warranted to fully realize the benefits and address the challenges associated with this technology, the continuous evolution of these models promises to further refine content generation processes, optimize user experiences, and unlock new creative possibilities across various industries, Understanding the impact of generative AI and making policy decisions around it requires new interdisciplinary scientific inquiry into culture, economics, law, algorithms, and the interaction of technology and creativity. Generative AI presents a transformative capability for e-commerce because of its applications. Automatic product description creation enables e-commerce companies to deliver precise results while boosting operational speed and customer fulfillment which results in better business performance.

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