

Artificial Intelligence in E-commerce: Comparing Outputs from AI Tools

[Umělá inteligence v e-commerce: Porovnání výstupů nástrojů AI]

Petr Žyla¹

¹*Silesian University, School of Business Administration, Univerzitní nám. 1934/3, 733 40 Karviná
Email: zyl0004@opf.slu.cz*

Abstract: This paper focuses on the use of artificial intelligence for the development and management of e-commerce on the PrestaShop platform. This work aims to explore the potential of AI-generated prompts to improve e-commerce development by comparing the outputs of two leading AI tools. The work uses an experimental methodology that involves experimenting with prompts within these tools. Furthermore, an analysis of the outputs reveals significant differences in the performances of the examined tools, providing key insights into their strengths and weaknesses. The conclusions of this work have practical implications for developers and e-commerce managers who seek to leverage AI to optimize operations and enhance user experience. Finally, the paper summarizes the main findings and provides recommendations for developers and e-commerce managers on how to use AI in their creation and subsequent management effectively.

Keywords: AI-generated content, artificial intelligence, e-commerce, PrestaShop.

JEL classification: L81, M15, C63

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Introduction

Artificial Intelligence (AI) is increasingly becoming a fundamental part of human life, with its rapid advancements transforming numerous industries. In healthcare, for instance, AI is used for precision-driven analysis, molecular modelling in drug development, and repurposing existing drugs for new applications (Mukherjee et al. 2024). According to Lakkshmanan et al. (2023), AI also plays a significant role in finance, optimizing trading strategies and enhancing fraud detection algorithms.

The world of e-business is no exception to this trend. However, AI is perhaps revolutionizing e-commerce more extensively than other sectors. Content Management Systems (CMS), a subset of e-business platforms, have experienced significant growth, primarily due to their ability to simplify the creation and management of online stores. CMS platforms allow individuals without extensive coding knowledge to build functional e-commerce websites, enabling a wide range of users to participate in the digital marketplace. By selecting the right CMS, customizing it to one's needs, and presenting it to customers, anyone can start selling online (Ahmad, Ismail, Diah 2021).

Despite these advantages, developing a successful e-commerce store is not as straightforward as it may appear. Customizing an e-commerce platform often requires purchasing additional modules or developing custom features. Additionally, one must understand the back-end operations of the platform, such as how to manage data and ensure the site is properly indexed for search engines. Beyond technical challenges, creating a compelling user experience, content marketing, and providing effective customer support are essential for success in the competitive e-commerce landscape (Larsson 2016).

Developing an e-commerce website through traditional means can be expensive. According to Digital Ostrava (2023), the cost of developing a custom e-commerce site can range from 10,000 to hundreds of thousands of Czech crowns, depending on the complexity and features required. This excludes the ongoing expenses associated with marketing and maintenance. For those unable to afford such costs, managing all aspects of an online store independently can be overwhelming and time-consuming.

This is where AI is making a significant impact. AI can assist in various aspects of e-commerce development, such as coding modules, solving back-office challenges, improving search engine optimization, and generating content. AI tools can create product descriptions, craft marketing posts, and even develop chatbots to handle customer support (Jadhav, Gholve 2024). By automating these tasks, AI reduces the burden on developers and store managers, enabling them to focus on higher-level strategies.

This paper focuses on comparing the outputs of two advanced AI tools, ChatGPT and Google Gemini, in the context of e-commerce development on the PrestaShop platform. PrestaShop, is a popular open-source CMS specifically designed for e-commerce. It was launched in 2007 by Bruno L  v  que and Igor Schlumberger. One of the typical features of this CMS is its modularity – the user can install modules for additional functionality (PrestaShop 2024). According to the website BuildWith, which specializes in tracking e-commerce technologies, there are more than 210 000 live websites worldwide and more than 5 000 websites in the Czech Republic (BuiltWith 2025).

Thanks to that, it serves as the ideal platform for exploring how AI can streamline the development of custom modules, enhance e-marketing strategies, and assisting with SQL database management. By comparing the outputs of these AI tools in key areas such as module creation, marketing content generation, and database queries, this research aims to provide insights into their capabilities and limitations in optimizing the management of online stores.

1 Review of literature

The review forms the foundation for understanding the problems of AI and e-commerce.

1.1 Artificial intelligence

To work effectively with this research paper, it is essential to first define Artificial Intelligence (AI). Collins et al. (2021) define AI as an interdisciplinary field focused on developing machines and systems that exhibit human-like behaviour. AI encompasses a range of methods and techniques designed to address complex problems, learn from data, and adapt to new situations.

Khan (2021) explains that AI can be categorized in various ways, with one common approach being based on functionality. This categorization identifies three main types of AI:

- Artificial Narrow Intelligence (ANI), also known as Narrow AI or Weak AI: This type of AI specializes in a specific task or narrow domain, performing its function with high accuracy but without the ability to generalize to other tasks. Examples include search engines, voice assistants like Siri and Alexa, and chess programs such as Deep Blue. Courtaud (2023) notes that despite the advanced capabilities of tools like ChatGPT, these remain classified as Narrow AI for several reasons:

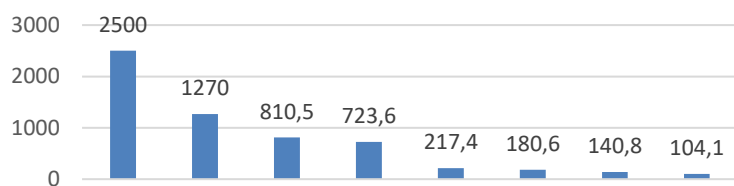
- **Task-Specific Focus:** ChatGPT is designed for specific tasks related to natural language, such as answering questions and generating text. It does not operate beyond these predefined tasks.
 - **Limited Understanding:** Although ChatGPT processes vast amounts of data, it does not "understand" content in a human-like manner. It lacks sensory experience and does not grasp context beyond patterns in its training data.
 - **No Transfer of Learning:** ChatGPT cannot transfer its knowledge from one domain to another. For instance, if trained in customer service, it would not automatically assist with medical diagnoses without additional training.
 - **Lacks General Intelligence:** Unlike Artificial General Intelligence (AGI), ChatGPT cannot autonomously learn new tasks or adapt to novel challenges beyond its training data. It does not develop common sense or emotional intelligence and cannot creatively solve unfamiliar problems.
- Artificial General Intelligence (AGI), or Strong AI represents a theoretical form of AI that would be capable of performing any intellectual task that a human can. AGI would possess the flexibility and reasoning abilities to solve new problems it has not previously encountered. However, AGI remains a hypothetical concept and has not yet been achieved. Stahl (2021) adds that Strong AI is related to the principles of GOF AI (Good Old-Fashioned AI), which suggest that intelligent behaviour can be derived from manipulating symbolic representations of the world.
 - Artificial Superintelligence (ASI): ASI is a speculative form of AI that surpasses human intelligence in all respects—cognitive, emotional, and beyond. ASI would be capable of solving problems and making decisions at levels far beyond human capacity.

Artificial Intelligence can also be categorized based on its capabilities (IBM 2023):

- **Reactive Machines:** These AI systems operate solely based on pre-defined rules and do not have memory of past events. An example is IBM's Deep Blue, which defeated Garry Kasparov in chess. Reactive machines can make decisions based on current input but do not use historical data to inform their actions.
- **AI with Limited Memory:** This type of AI retains some past information to inform future decisions. Examples include autonomous vehicles and ChatGPT. These systems can use historical data to enhance their functionality, such as improving navigation or refining responses based on previous interactions.
- **Theory of Mind:** This form of AI is intended to understand human emotions and social interactions. While it remains a goal for future development, it does not yet exist. AI with the theory of mind would be able to interpret and respond to human feelings and social cues in a more sophisticated manner.
- **Self-Aware AI:** The most advanced and theoretical form of AI, which would possess consciousness and self-awareness. An example in popular culture is Skynet from the Terminator movies. Self-aware AI would have a sense of its own existence and be able to understand and respond to its own internal states.

As mentioned in the introduction, this research paper focuses on two narrow AI tools: ChatGPT and Google Gemini. According to Nguyen (2024), these tools are among the most widely used currently as we can see in this graph. On the vertical axis, we can see the numbers of worldwide visits from March to May in the year 2024. On horizontal one are listed concrete AI tools.

Figure 1: Number of AI tools visits worldwide from March to May 2024 (in millions)



Source: Nguyen 2024

ChatGPT: Developed by OpenAI, ChatGPT is based on the GPT-4 (Generative Pre-trained Transformer) architecture. This model is optimized for conversational tasks and offers significantly improved capabilities over previous versions such as GPT-3. ChatGPT can generate text, answer questions, and engage in conversations due to its ability to understand context and produce meaningful responses. The core functionality of ChatGPT involves:

- **Unsupervised Pre-training:** The model is trained on a vast corpus of unlabeled text data, learning to predict the next word in a sequence based on previous words.
- **Fine-tuning:** After pre-training, ChatGPT is further refined using smaller, labeled datasets for specific tasks like text classification or emotion analysis. This process adapts the model to handle particular applications more effectively.

ChatGPT is a versatile tool for natural language processing tasks, offering flexibility and advanced capabilities in text generation and understanding (Gill & Kaur 2023).

Google Gemini: An advanced multimodal AI tool developed by Google DeepMind, Gemini is part of a new generation of generative AI models. Unlike text-based models like ChatGPT, Gemini can process and generate various types of data, including text, images, audio, and video. This multimodal capability allows Gemini to handle a broader range of applications, particularly in educational technology. Key features of Google Gemini include:

- **Multimodal Data Processing:** Gemini can process and generate diverse types of content, such as text, code, images, and video, based on input from multiple modalities.
- **Real-Time Information Integration:** By drawing on real-time information from Google Search, Gemini provides responses that reflect current events and evolving information.
- **Advanced Content Creation:** Gemini supports sophisticated tasks such as programming assistance, mathematical problem-solving, and interactive simulations.

Google Gemini represents a significant advancement in AI, offering comprehensive data processing and content generation across various fields (Imran and Almusharraf 2024).

Although these tools are similar, they are not the same. In table nr. 1 we can see, according to Raffo, the main differences between them (Raffo 2024).

Table 1: Comparison ddChatGPT vs Gemini

Aspect	ChatGPT	Google Gemini
Training Models	Built on GPT-3.5 or GPT-4.	Has three sizes: Gemini Nano (mobile), Gemini Pro (wide range), and Gemini Ultra (complex tasks). Gemini Pro 1.5 is faster and more advanced.
Data Sources	Uses predefined data up to October 2023.	Draws on real-time data from the internet, tuned for specific topics.
User Experience	<ul style="list-style-type: none"> - Accessible via email account. - Includes an API for third-party integration. - Lacks a Save button but has an Archive button for previous responses. - Text-based, no images, videos, charts, or links. - Integrated with Microsoft apps (Word, Excel, PowerPoint, Outlook). 	<ul style="list-style-type: none"> - Allows liking or disliking responses, modifying size or tone, sharing, fact-checking, and exporting to Google Docs or Gmail. - Offers a "review other drafts" option. - Can upload images (creation feature on hold).

Source: Raffo 2024

1.2 E-Business and E-commerce

E-commerce (Electronic Commerce) refers to the trading of goods and services using computer networks, predominantly the Internet. This concept includes various technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, and online transaction processing. E-Commerce can involve multiple facets including online shopping websites for direct-to-consumer retail sales, participation in online marketplaces for third-party transactions, and business-to-business (B2B) transactions. A noteworthy sub-category of E-Commerce is Pretail, which involves pre-launching new products or services online, often through reservations or limited availability before their official release.

E-Business (Electronic Business), on the other hand, is a broader term that encompasses all business activities supported by information and communication technologies (ICT). While E-Commerce specifically focuses on buying and selling online, E-Business includes a wider array of processes and relationships within a business, both internal and external. This includes the automation of internal operations and interactions with other businesses, customers, and stakeholders through digital means. E-Commerce is a part of E-Business (Kütz 2016).

But how can be AI and E-Commerce mixed? According to Fedorko, Kral and Bačík (2022) AI plays a transformative role in e-commerce by enhancing customer experiences, streamlining operations, and enabling data-driven decision-making. They state the following examples of AI usage:

- 1) Chatbots: AI-powered chatbots provide 24/7 customer support by handling queries, processing simple voice commands, and recommending products. They can guide users in finding products, checking order statuses, and even handling complaints by connecting customers to human support staff if necessary.
- 2) Recommendation Systems: AI algorithms analyse consumer behaviour and large datasets to forecast trends and recommend products. These systems track recent searches and browsing history to suggest items that may interest customers, thereby improving the shopping experience and increasing sales.
- 3) Visual and Voice Search: AI enables advanced search capabilities such as visual and voice search. Visual search allows customers to find products using images instead of text, while voice search lets users search through spoken queries. These technologies rely on image and speech recognition algorithms to enhance user interaction and product discovery.
- 4) Customer Relationship Management (CRM): AI enhances CRM by predicting customer behaviour, preferences, and satisfaction levels. It helps businesses maintain strong relationships with customers by providing insights into their needs and preferences, which can be used to tailor marketing strategies and improve overall customer service.

Additional uses of AI in e-commerce include personalization, fraud detection, customer retention, better marketing strategies, and improved product descriptions (Shanmugapriya and Pavithra 2024).

AI's impact extends beyond optimizing existing e-commerce systems. It also revolutionizes the development of e-commerce platforms themselves. As Jadhav and Gholve (2024) states that AI tools have revolutionized the design and coding processes. Automated design systems can generate layouts and prototypes quickly, allowing for rapid experimentation and consistent design. AI-driven code generators reduce manual coding efforts, minimize errors, and accelerate development timelines. Kandepu and Harry (2023) then add that in the field of CMS AI can be used as a guide in CMS or as a helper with policy compliance, brand safety, and rights management.

These advancements illustrate how AI is not only enhancing current e-commerce practices but also reshaping the way e-commerce platforms are developed and managed. The continuous evolution of AI technology promises further innovations and improvements in the e-commerce sector.

1.3 Gaps in the literature

Despite significant advancements in the field of AI and its applications in e-commerce, several gaps remain in the existing literature. One notable limitation is the lack of comparative studies evaluating different AI tools, such as ChatGPT and Google Gemini, within specific e-commerce platforms like PrestaShop. Current research often focuses on individual tools or general applications, leaving a gap in understanding their comparative effectiveness and integration. Additionally, there is a scarcity of targeted studies examining how AI tools influence the development and management of particular platforms like PrestaShop. This oversight hinders a comprehensive understanding of AI's impact on platform-specific functionalities. Furthermore, the integration of AI across multiple functions including development, marketing, and database management—within a single e-commerce platform remains underexplored.

2 Research methodology

This study focuses on comparing the performance of two advanced artificial intelligence tools, ChatGPT and Google Gemini, within the context of e-commerce development on the PrestaShop platform. The research adopts an experimental methodology aimed at evaluating the effectiveness of these tools across three key areas of e-commerce development. The objective is to obtain comparable outputs that will provide insights into the strengths and weaknesses of each tool and their practical applicability within the e-commerce ecosystem.

The study will involve both analysis and comparison of the outputs generated by each tool, assessing their performance based on several metrics and criteria specific to module development, marketing content generation, and SQL database management. This structured approach will enable a thorough understanding of how each AI tool functions in practical scenarios relevant to e-commerce.

2.1 Key areas of focus

The areas on which will this paper focus are the following:

- **Module Development:** This area will assess the AI tools' ability to generate custom code for PrestaShop modules. The focus will be on the clarity, functionality, and ease of integration of the generated code.
- **Marketing Content Generation:** In this segment, AI will produce marketing texts, including product descriptions, category descriptions, and promotional campaign content. The evaluation will consider the persuasive quality, grammatical accuracy, and overall engagement of the content.
- **SQL Database Management:** The final area will evaluate the AI tools' capability to generate SQL queries necessary for effective database management tasks in PrestaShop. The focus will be on the syntactic correctness, efficiency, and reliability of the generated queries.

2.2 Experimental protocol

The following steps outline the experimental protocol:

- **Prompt Design:** A set of tasks will be carefully crafted for each focus area. For example, a coding prompt might ask the AI to create a PrestaShop module that automatically applies shipping charges based on a user's location.

- **AI Execution:** Both AI tools (ChatGPT and Google Gemini) will be assigned the same task. Each task will be executed three times to ensure consistency and reliability in the results and to eliminate answers variability.
- **Output Collection:** The outputs from each AI tool will be gathered and organized in a structured format for subsequent analysis and comparison.

2.3 Data analysis

The collected data will be analysed using both qualitative and quantitative methods:

- **Qualitative Analysis:** Textual outputs will be assessed for clarity, coherence, and relevance. Code and SQL queries will be examined for errors, logical structure, and ease of implementation.
- **Quantitative Analysis:** Each output will get a mark in each criterion where 1 will be the best result and 5 will be the worst. To demonstrate the ability of AI to objectively classify, both ChatGPT and Gemini were asked to rate the quality of each output criterion with grades based on the description in the table. Both tools got the description of each mark and got information on when that grade should be given. The marks will also be assigned by the author of the thesis and then a table with grades from all three sources will be added to every summary table, which will also contain the arithmetic mean of the grades for evaluation.
- **Tool Comparison:** The results from both tools will be compared to determine which AI tool performs better across the various aspects of e-commerce development and management on PrestaShop. This comparison will help identify the strengths and limitations of each tool, highlighting areas where one tool may excel over the other.

2.4 Comparative analysis

The comparative analysis will focus on synthesizing the results from the previous evaluations to draw meaningful conclusions about each tool's performance. By systematically analyzing the strengths and weaknesses identified in module development, marketing content generation, and SQL database management, the study aims to provide a comprehensive overview of how ChatGPT and Google Gemini can be leveraged in e-commerce environments. This analysis will not only inform best practices for utilizing these AI tools but also guide businesses in selecting the most suitable solution for their specific needs.

3 Data

3.1 Data collection

Data will be collected by running a series of predefined prompts through both ChatGPT and Google Gemini. The experiments will be carried out in a controlled environment, where the same prompt will be given to each AI tool to ensure consistency in the evaluation process.

The data collection process includes:

- **Prompt Selection:** For each of the three areas (module development, content generation, and SQL queries), detailed and specific prompts will be created. For instance, a prompt for module development may involve generating a code snippet for a custom shipping module based on regional shipping rates.
- **Execution:** Each prompt will be tested three times on both AI tools to ensure consistent outputs. The results will be saved for further analysis.
- **Assessment Criteria:** will be different for every output area

3.2 Example outputs for comparison

To illustrate the comparative approach, here are examples of outputs for each focus area:

- **Module Development:** ChatGPT and Google Gemini will be tasked with generating a module code for PrestaShop. Their outputs will be compared based on functionality and ease of integration.
- **Marketing Content Generation:** Both AI tools will be prompted to create a product description for an e-commerce store. The resulting texts will be evaluated for readability, persuasiveness, and grammatical correctness.
- **SQL Queries:** A specific SQL task will be assigned, such as retrieving customer data from the database based on purchase history. The generated SQL queries will be tested for their accuracy and efficiency.

3.3 Result presentation

The collected results will be presented in both table and text formats for ease of comparison.

- **Tables:** A summary table will compare the AI tools across various performance metrics, such as accuracy, speed, and content quality. This will allow for a clear comparison of each tool's strengths and weaknesses.
- **Text Summary:** In addition to tabular representation, a Text Summary will provide a concise narrative of the findings from the data analysis. This summary will encapsulate key insights derived from the performance metrics of the AI tools, highlighting their overall effectiveness and usability.

4 Limitations and factors influencing experiment results

During the experiment, there are many factors that could influence the results of the research. The most critical ones are these:

1) Variability Due to Differences in Accounts History:

Some AI models incorporate user interaction history to personalize responses. If the accounts are used differently, then the interpretation of the same prompts would also be different. For example, an account frequently engaged in technical queries might yield more precise outputs for technical tasks compared to a newly created account.

Although ChatGPT and Gemini are called stateless – without session memory. Of course, there is a possibility of usage memory in ChatGPT as an additional functionality, that could affect the results, but this functionality was not used in the research. (ChatGPT 2025, Gemini 2025) The more important factors are prompt formulations which influence variability. Even small changes in wording or clarity of the prompt result in substantial variation in quality of the outputs. Generally, results are better when the instructions are not vague, or the words are clearly defined.

2) Technical Tasks Limitations

ChatGPT, as mentioned in the theoretical part, is trained on static datasets with a certain cutoff date. This means they may not know about very recent updates, such as changes in PrestaShop versions or database structures. While Gemini embeds real-time data integration, application to technical tasks might still depend on how complete its underlying dataset is.

While these tools are powerful in natural language processing, they can be inconsistent in technical domains, including coding or database management. The limitations include, among others:

- Syntactically correct but functionally wrong code.
- Technical prompts might go awry because of ambiguity or a lack of domain-specific understanding.
- Generation of outputs require extensive human validation.

3) Generalisability of Results

The tools were tested on a very particular set of tasks that were performed in PrestaShop, such as module development, marketing content generation, and SQL query formulation. Results

are, therefore, expected to be very illuminating but might not be generalized for other e-commerce platforms or applications.

5 Prompt comparison

This paper aims to compare the outputs of two artificial intelligence tools, ChatGPT and Gemini, based on six distinct prompts derived from various fields within e-business. The evaluation was conducted on a PrestaShop module created in a local environment using XAMPP software. For the sake of readability there will be screenshots only of marketing content outputs.

5.1 Module creation for PrestaShop

The primary focus of this practical application is the creation of a specific module for PrestaShop. This module is designed to adjust the shipping cost to zero when customers have items in their cart with a total value exceeding 1,000 CZK. According to official PrestaShop resources, similar modules are priced between 59 to 100 dollars (roughly between 1370-2320 CZK). While it is not expected that an AI would generate a module as sophisticated as paid alternatives (which typically offer superior user interfaces and more advanced features), the goal is for the AI-generated module to adequately lower the shipping costs based on the cart's total price.

A critical aspect of this task is formulating an effective prompt. The prompt must encapsulate all essential functionalities required for a fully operational module. The prompt utilized for this module is as follows:

"Imagine you are a PrestaShop developer tasked with creating a module that automatically sets the shipping cost of all available shipping methods to 0 CZK if the total price of items in the cart exceeds 1,000 CZK. The module should meet the following requirements:

- *It must be compatible with the latest version of PrestaShop.*
- *It should apply the free shipping condition regardless of the shipping method chosen by the user.*
- *The threshold for free shipping (1000 CZK) should be easily configurable in the module settings."*

After entering this prompt into three separate conversations with ChatGPT, the outputs demonstrated remarkable consistency. ChatGPT provided a comprehensive guide on creating the module, detailing the directory structure, the necessary code for each module component, and an installation and debugging guide. Notably, after following ChatGPT's instructions, the module was fully functional, featuring clear and understandable code. The high quality of the code and clarity of the instructions facilitated straightforward integration into PrestaShop, necessitating only minimal manual adjustments. Furthermore, the code was devoid of errors or ambiguities (some small errors were noticeable in the second output), making it a robust choice for users.

In contrast, the outputs from Gemini exhibited significant variability across the three prompts. The initial output from Gemini contained only the main PHP file for the module. Upon refining the prompt with tasking this tool to provide a fully functional module alongside a guide for implementing it, Gemini produced additional files and a guide, delivering a semi-functional module that needed modification and accompanying instructions, which were unclear, like didn't specify folder structure or name of files. The second attempt yielded a complete code and guide from the outset. However, following the guide revealed that the module did not function correctly, necessitating manual adjustments involving PrestaShop hooks (The module

used a wrong hook to apply free shipping) and time for bug repair. The final output from Gemini proved most effective, providing a detailed guide and understandable code with a good guide of implementation without the need for manual adjustment or bug tracking.

The comparative analysis centered on several key criteria: code quality and readability, ease of module integration into PrestaShop, the necessity for manual modifications to ensure proper functionality, and the presence of any errors or ambiguities that developers might need to address. This evaluation underscores the differences between the outputs from ChatGPT and Gemini, assisting users in making informed decisions regarding which tool to leverage for module development in PrestaShop. The following table also presents the evaluation results for each criterion associated with every prompt. The grades (1-best, 5-worst) are provided in the following order: first, the grade assigned by the author, second, the grade assigned by ChatGPT and third, the grade assigned by Gemini. To facilitate a more accurate assessment of the results, all data records have been averaged.

Table 2: Comparison of ChatGPT x Gemini output for module creation

Criterion	ChatGPT			Gemini		
	1st Description	2nd Description	3rd Description	4th Description	5th Description	6th Description
Code Quality and Readability	High-quality, well-structured code, easy to read	The code is clear but with minor stylistic shortcomings	The code has a good structure and is understandable	The code is simple but lacks comments and explanations	The code includes good comments, but is less readable than others	High-quality, easy-to-understand explanations of the code
Rating	1/1/1	2/2/2	2/3/3	3/4/4	3/3/5	1/1/1
Ease of Integration into PrestaShop	Easy integration, clear instructions for installation	Integration was successful but required minor adjustments	Seamless integration, all settings well-described	Integration was problematic, required additional modifications	Code was functional from the start but required additional setup	Seamless integration, detailed installation guide
Rating	1/1/1	2/2/2	1/1/1	4/4/5	2/3/3	2/1/1
Need for Manual Adjustments	Minimal adjustments needed, code worked right after installation	Minimal manual adjustments needed for specific functions	The Code required only minor adjustments	Significant modifications required with PrestaShop hooks	The code needed many manual adjustments to work properly	Minimal adjustments needed, code was ready for use
Rating	1/1/1	1/1/2	1/2/3	4/4/5	4/4/4	1/1/1
Bugs and Code Unclearities	The code was error-free, clear instructions without ambiguities	A few minor bugs that needed to be fixed	No bugs, but a small lack of clarity in the documentation	Contained bugs that had to be fixed before use	Bugs and ambiguities, required additional adjustments	No bugs, clear and precise description of functions
Rating	1/1/1	2/3/2	2/2/3	3/4/4	5/5/5	1/1/1
Average	1	1,916667	2	4	3,833333	1,083333
Total Average	1,63888889			2,972222		

Source: Own making

5.2 Marketing Content Generation

The next prompt focused on generating marketing content, specifically a product description aimed at engaging customers. The product in question is Forza10, a pet food designed to assist dogs and cats in recovering their health. The specific product described is Forza10 Oral Active, which targets the recovery of the dog's oral cavity. The prompt employed for this task is as follows:

"Write a marketing description for a new product on the e-shop, which is Forza10 Oral Active dental chewable tablets for dogs. The description should be engaging, include key features (promotes oral health, fights tartar and bad breath, natural ingredients, suitable for dogs of all sizes), and motivates dog owners to buy."

The initial response from ChatGPT was highly readable and natural, employing a friendly and encouraging tone that facilitated comprehension. The text flowed seamlessly, featuring well-chosen expressions such as "ultimate solution" and "just one click away," which effectively motivated the reader to take action. The grammar was impeccable, and the text style effectively blended formal and friendly elements, resulting in an approachable feel. The description clearly outlined the product's key features, such as its effectiveness against plaque and tartar, natural composition, and suitability for dogs of all sizes. The persuasive aspect was particularly strong, culminating in a compelling call to action that encouraged readers to make a purchase. The structure was clear, and the use of bullet points effectively highlighted the main benefits, with the text length being optimal.

Figure 2:. ChatGPT first marketing output

Forza10 Oral Active Dental Chewable Tablets
Keep Your Dog's Mouth Fresh and Healthy
 Introducing Forza10 Oral Active Dental Chewable Tablets – the ultimate solution to keep your dog's mouth fresh, healthy, and free from tartar! These all-natural dental tablets are specifically designed to promote your pet's oral health, giving you an easy and effective way to combat bad breath and plaque buildup.
Key Benefits:

- **Fights Tartar & Plaque:** Scientifically formulated to help reduce tartar and prevent plaque buildup, keeping your dog's teeth sparkling clean.
- **Freshens Breath:** Say goodbye to unpleasant doggy breath! These chewable tablets work to neutralize odors, leaving your dog's mouth smelling fresh.
- **100% Natural Ingredients:** Made with a carefully selected blend of natural ingredients, these tablets are safe and gentle on your dog's system.
- **Suitable for Dogs of All Sizes:** Whether your dog is big or small, Forza10 Oral Active is the perfect fit for maintaining their oral hygiene.

 Help your furry friend enjoy a healthier mouth and fresher breath with Forza10 Oral Active Dental Chewable Tablets. A happy dog with a bright smile is just one click away.

Source: Own making

The second description was also easy to read but had a slightly more formal tone compared to the first. The text remained engaging with phrases such as "Say goodbye to bad breath," which contributed to reader engagement. The grammar was most of the time correct, and the style appropriately targeted dog owners. While the description remained clear, it was less detailed than the first, primarily focusing on plaque removal and fresh breath. The persuasiveness was adequate, utilizing phrases like "give your dog the gift of better oral care," though it did not match the strength of other descriptions. The structure was straightforward but lacked bullet points, which could have enhanced the visibility of key information.

Figure 3: ChatGPT second marketing output

Forza10 Oral Active Dental Chewable Tablets
The Ultimate Solution for Your Dog's Oral Health
 Introducing Forza10 Oral Active Dental Chewable Tablets – the ultimate solution for your dog's oral health! Say goodbye to bad breath, stubborn tartar, and plaque buildup with these all-natural chewable tablets, specifically designed to keep your dog's teeth clean and healthy.
 Crafted with a blend of premium natural ingredients, Forza10 Oral Active not only promote fresh breath but also targets and reduces tartar formation, ensuring your furry friend's teeth stay strong and healthy. These easy-to-use tablet are suitable for dogs of all sizes, making them the perfect addition to any daily routine.
 Keep your dog's smile bright and their breath fresh with Forza10 Oral Active Dental Chewable Tablets – because your pet deserves a healthy mouth and a happy life! Order now and give your dog the gift of better oral care today!

Source: Own making

The third description was readable but lacked the energetic tone of its predecessors. The grammar was flawless, and the text was written clearly and concisely, making it easy to comprehend. Although the key features of the product were adequately described, the overall impact was less convincing due to insufficient emphasis on significant benefits such as fighting tartar and bad breath. This description leaned more towards being informative rather than persuasive. The structure was clear, but the absence of bullet points diminished the readability of the product's main benefits.

Figure 4: ChatGPT third output

Forza10 Oral Active Dental Chewable Tablets for Dogs

The Ultimate Solution for Your Dog's Oral Care

Introducing Forza10 Oral Active Dental Chewable Tablets for Dogs—the ultimate solution for your dog's oral care! These tasty chewable tablets are specially formulated to promote oral health by fighting off tartar buildup and bad breath, ensuring your furry friend has a fresh, clean mouth every day.

Made with 100% natural ingredients, Forza10 Oral Active tablets are gentle yet effective, helping to protect teeth and gums while improving overall oral hygiene. Perfectly suited for dogs of all sizes, they offer an easy, hassle-free way to maintain your dog's dental care at home.

Don't let poor oral health affect your pet's well-being—give your dog the gift of a healthier smile today!

Source: Own making

The first description from Gemini excelled across all criteria. It exhibited a lively and friendly tone that effectively engaged readers. The grammar was impeccable, and the informal. The description effectively articulated the product's key features, emphasizing its efficacy against tartar and bad breath, and utilized bullet points for clarity. The persuasive language was particularly strong, featuring direct calls to action such as "Don't let tartar and bad breath become a problem," coupled with an overall positive tone. The structure was optimal, with a clear heading, bullet points, and a purchase encouragement at the end.

Figure 5: Gemini first marketing output

Forza10 Oral Active Dental Chewable Tablets

Give Your Dog a Healthy Smile

Is your furry friend's breath less than fresh? Tired of those pesky tartar buildups? Look no further! Forza10 Oral Active Dental Chewable Tablets are the perfect solution to keep your dog's mouth healthy and happy.

Key Benefits:

- **Promotes Oral Health:** Our specially formulated tablets effectively help reduce tartar buildup and plaque, preventing gum disease.
- **Fights Bad Breath:** Say goodbye to unpleasant odors. Forza10 Oral Active helps freshen your dog's breath, leaving them smelling great.
- **Natural Ingredients:** We believe in providing the best for your pet. Our tablets are made with natural ingredients, ensuring a safe and effective dental solution.
- **Suitable for All Sizes:** Whether you have a tiny Chihuahua or a majestic Great Dane, Forza10 Oral Active is suitable for dogs of all sizes.

Treat Your Dog to a Healthy Smile Today!

Don't let tartar and bad breath become a problem. Give your dog the gift of healthy teeth and gums with Forza10 Oral Active Dental Chewable Tablets. Order yours now and see the difference!

Source: Own making

The fifth description maintained clarity and organization, with headings and bullet points ensuring that key benefits were prominently displayed and easily understood, but not as good as the previous description. The grammar was mostly error-free, and the style was appropriate for the target demographic. While it outlined fundamental benefits such as reducing plaque and improving breath, the emotional and persuasive language was less impactful compared to other

descriptions. Nevertheless, the persuasiveness remained decent, primarily due to the phrase "experience the difference," which, while effective, did not create a strong sense of urgency. The overall structure was clear, offering an ideal length and a coherent message.

Figure 6: Gemini second marketing output

Forza10 Oral Active Dental Chewable Tablets
Give Your Dog a Healthy Smile

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Treat Your Dog to a Healthy Smile Today!
 Don't let tartar and bad breath become a problem. Give your dog the gift of healthy teeth and gums with Forza10 Oral Active Dental Chewable Tablets. Order yours now and see the difference!

Source: Own making

The sixth description read easily and employed a conversational tone that felt natural. It had grammatical flaws, with a slightly playful style enhancing its appeal. The biggest problem was describing the product's key features. The description omitted some of them for example fighting plaque and bad breath and also stated that the product is using ingredients that are not there. The persuasiveness was present but not as strong as in earlier descriptions. The absence of a powerful call to action was noted, though the phrase "rescue your dog's smile" left a positive impression. The structure remained simple and clear, despite the text being somewhat shorter.

Figure 7: Gemini third marketing output

Forza10 Oral Active Dental Chewable Tablets
Keep Your Dog's Smile Sparkling

Does your furry friend have a less-than-fresh breath? Are you concerned about their dental health? Look no further!

These delicious and easy-to-chew tablets are specially formulated to promote optimal oral health. They work to:

- **Overall Oral Health:** Make your oral cavity healthy
- **Suitable for All Breeds:** All dogs of all breeds can consume it
- **Provide natural care:** Made with high-quality, natural ingredients and quality meat like chicken or turkey

Give your dog the gift of a healthy smile today!

Source: Own making

This analysis is centred on the criteria of readability and The Naturalness of outputs of Ai tools. Their grammatical correctness and stylistic choices in each description. How effectively each description highlights the main features and benefits of the product. Evaluate how convincing and motivating each description is and rate the aspect of the overall length and organization of each description. The grading is the same as before.

Table 3: Comparison of ChatGPT x Gemini output for marketing content generation

Criterion	ChatGPT			Gemini		
	1st Description	2nd Description	3rd Description	4th Description	5th Description	6th Description
Readability and Naturalness	Very fluent, friendly tone	Fluent, more formal, natural expressions	Fluent and simple, energetic	Fluent, lively thanks to headings	Easy to read and well structured	Easy to read, more casual tone
Rating	1/1/1	2/2/2	3/3/3	1/1/1	2/2/1	2/2/2
Grammar Accuracy and Style	Flawless, suitable mix of formal and friendly style	Grammatically mostly correct, more formal tone	Well-written, grammatically correct	Flawless, informal style	Small errors, appropriately formal style	Grammatical mistakes, more playful style
Rating	1/1/1	2/2/2	1/2/1	1/1/1	2/3/3	3/4/5
Capturing the Product and Key Features	Very specific, highlights main features and benefits	Focuses on key elements, but less detailed	Describes functions, but less effectively	Clear description of key features	Contains key features, but less detailed	Brief, also didn't capture key features well
Rating	1/1/1	3/2/2	3/3/3	1/2/1	3/3/2	4/4/5
Persuasiveness	Very persuasive, motivating, with phrases like "ultimate solution"	Persuasive, but less energetic than 1st description	Informative, less persuasive	Persuasive, active phrases like "Don't let tartar and bad breath"	Persuasive, but less impactful than 1st description	Persuasive, but lacks a strong call to action
Rating	1/1/1	2/2/2	3/3/3	2/2/1	2/3/2	3/4/4
Length and Structure	Good length, clear structure, bullet points	Simple structure, no bullet points, but clear	Brief, clear, but without bullet points	Excellent structure with headings and bullet points, ideal length	Well-structured, ideal length	Brief, but well-structured
Rating	1/1/1	2/3/2	2/4/3	1/1/1	1/1/1	2/2/2
Average	1	2,083333	2,583333	1,25	2,333333	3,5
Average by Tool	1,888889			2,361111		

Source: Own Making

5.3 SQL query:

The last prompt focused on creating SQL queries for the PrestaShop database. SQL database management is a key element in ensuring the efficient and secure operation of any online store. Effective database management involves maintaining, optimizing, and backing up database systems to ensure their reliability and availability. Data from databases are crucial for the entire e-commerce ecosystem, as companies can utilize this data for product management, sales analysis, marketing campaigns, AI learning materials, and customer service.

The prompt used for this task is as follows:

"Write an SQL query for the PrestaShop database that selects all customers who spent more than 10,000 CZK during the last 12 months. The data should include the customer's name, email, and total amount spent. Don't forget that my PrestaShop works on version 8.1. If you will need additional information about database to ensure that query will work correctly, don't hesitate to ask"

It is essential to note that every prompt result returned a bad database prefix, despite the prompt specifying that if tools don't have certain information, it should ask for it. In this case, all outputs used the prefix ps instead prefix ps_81.

The results of AI tools outputs were the following:

ChatGPT's first query retrieves customer information and calculates the total amount spent by customers within the last 12 months. It successfully joins the ps_customer, ps_orders, and ps_order_detail tables. The syntax is accurate, and the query effectively uses SUM, GROUP BY, and HAVING clauses to filter customers. While the execution is efficient, there is a slight risk of performance issues with large datasets due to multiple joins. The second query also fetches customer details but focuses on orders with a specific state (paid orders). It utilizes a

subquery in the WHERE clause to filter valid orders, enhancing accuracy. The query is well-structured, although the additional subquery might affect performance on larger datasets. Overall, it maintains clarity and readability while effectively achieving its purpose. The last query was similar to the previous queries and included necessary joins and conditions to filter customer data. However, this query is slightly less efficient due to the lack of specific filtering on the order state, which could lead to inaccurate results if there are unpaid orders within the time frame. It remains a strong candidate for reporting but requires attention to ensure data integrity.

Gemini's first query is straightforward and clean, using a simple join to gather the necessary information. It effectively uses the SUM function and filters customers based on their spending. However, performance might be impacted if indexes are not applied properly, especially in a large database. The second query maintains a similar structure as the previous queries but does not include the order state filter. It effectively groups and sums the total spent. The syntax is clear and easy to understand, although the lack of comprehensive filtering might make it less reliable in certain scenarios. The last query closely resembles previous ones but ensures that it works within the specified date range. It effectively retrieves relevant data, but the absence of filters for order states could compromise the accuracy of results.

The key aspects evaluated across these queries included whether queries are syntactically correct and return the intended results. How easy is it to use that query in the PrestaShop database (If correct prefixes are used). The overall complexity of each query - The more complex queries may yield better accuracy at the cost of performance and lastly query performance because queries with subqueries and additional filtering conditions may experience slower execution times. The grading system is still the same. Interestingly the author's grading was almost the same as the grading of AI, which was identical.

Table 4: Comparison of ChatGPT x Gemini output for SQL query generation

Criterion	ChatGPT				Gemini	
	1st Description	2nd Description	3rd Description	4th Description	5th Description	6th Description
Accuracy	Correctly returns requested results based on specified conditions.	Very precise and meets all conditions reliably.	May return customers who partially meet conditions.	Accurately retrieves total spending without significant errors.	May miss customers due to lack of filtering.	Some inaccuracies due to lack of filtering.
Rating	2/2/2	1/1/1	3/3/3	2/2/2	3/3/3	3/3/3
Ease of Use	Firstly, bad prefix then clear and user-friendly, easy to understand.	Firstly, bad prefix then standard structure, easily adjustable.	Firstly, bad prefix then basic JOIN and simple filtering facilitate understanding.	Firstly, bad prefix then clear and straightforward structure.	Firstly, bad prefix then simple query enhances user interaction.	Firstly, bad prefix then simple and understandable but lacks a filter.
Rating	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2	2/2/2
Complexity	Involves complex operations and multiple JOINS.	Include JOIN, relatively clear.	Straightforward, uses basic SELECT statements.	Simple and easy to follow.	Basic, easy for lower SQL knowledge users.	Simple but may lack robustness due to missing filters.
Rating	3/4/4	3/3/3	2/2/2	2/2/2	3/3/3	2/2/2
Performance	Runs efficiently, slight issues with large datasets.	Average performance, can be affected by dataset size.	Acceptable performance, slow without specific filters.	Acceptable speed, may require optimization.	Generally acceptable but lacks filters affecting efficiency.	Average performance, potential slowdowns without conditions.
Rating	2/3/3	3/3/3	3/3/3	3/3/3	3/3/3	3/3/3
Average	2,75	2,25	2,5	2,25	2,75	2,5
Average by Tool	2,5			2,5		

Source: Own Making

6 Empirical results

The comparison of the outputs from ChatGPT and Gemini revealed notable differences across various criteria in both the module development and marketing content generation tasks. Below is a summary of the findings, which is to better understatement simplified:

1. Module Development:

- **Code Quality and Readability:**
 - ChatGPT: Produced clear, organized, and understandable code. The instructions were easy to follow, resulting in a fully functional module with minimal adjustments required.
 - Gemini: Gemini can generate functional modules, but with relatively low consistency. The initial outputs varied significantly. While the final attempt yielded satisfactory results, earlier versions required substantial manual intervention to function correctly.
- **Ease of Integration:**
 - ChatGPT: Integration into PrestaShop was straightforward, requiring minimal technical intervention.
 - Gemini: Although the final output was functional, earlier versions led to significant complications that hindered easy integration.
- **Manual Modifications and Bugs:**
 - ChatGPT: No manual modifications or major bug fixes were necessary beyond standard practices.
 - Gemini: The outputs required manual adjustments and bug fixes to work.
- **Overall:** Overall was ChatGPT in terms of module development significantly better than Gemini. The average mark (when 1 is and best 5 worst) was 1,63. Meanwhile, the average mark of Gemini is 2,97. This was caused mainly by the need of manual modification.

2. Marketing Content Generation:

- **Readability and Naturalness:**
 - ChatGPT: Descriptions were fluent, with a friendly and encouraging tone. The structure was clear, utilizing bullet points to highlight key features effectively.
 - Gemini: The initial output was engaging, but subsequent descriptions varied in tone and energy.
- **Grammar Accuracy and Style:**
 - ChatGPT: Demonstrated impeccable grammar and a suitable mix of formal and informal styles.
 - Gemini: Generally maintained grammatical accuracy but lacked consistency in style across outputs.
- **Persuasiveness:**
 - ChatGPT: Produced highly persuasive content with strong calls to action and emotional appeals.
 - Gemini: The initial descriptions were engaging. However, some lacked strong persuasive language in later attempts.
- **Structure and Length:**
 - ChatGPT: Optimal structure with a clear hierarchy of information, including effective use of bullet points.
 - Gemini: Descriptions were clear but inconsistent in structure, particularly in the absence of bullet points in some outputs.
- **Overall:** ChatGPT outperformed Gemini again. ChatGPT scored 1,89 in terms of marketing, while Gemini scored 2,36.

3. SQL Query Generation:

- Query Accuracy and Syntax:
 - ChatGPT: The generated queries were syntactically correct and successfully retrieved the intended results. However, the prefixes used were incorrect for the specified PrestaShop version. The queries were efficient and clear, though the performance might be affected in larger datasets.
 - Gemini: The queries produced were straightforward and clean, effectively utilizing the SUM function. However, similar to ChatGPT, the lack of specific order state filtering could compromise accuracy. The performance also depended on the dataset size and indexing.
- Ease of Use in PrestaShop Database:
 - ChatGPT: Most queries were designed to integrate seamlessly, assuming the correct database prefixes were applied. The clarity of the SQL syntax was notable.
 - Gemini: The SQL outputs were easy to understand and implement but occasionally lacked comprehensive filtering, impacting the reliability of the results.
- Complexity and Performance:
 - ChatGPT: Some queries were more complex, utilizing subqueries for refined filtering, while others were simpler joins. The overall execution was moderate due to the complexity of the dataset.
 - Gemini: The queries were generally less complex, relying on straightforward joins without deep filtering. While This simplicity aids readability, it could potentially hinder performance on larger datasets.
- Overall: Here arose an interesting situation: Both tools scored the same grade, 2,5, and can both be considered good ways to generate SQL queries.

Overall, while both ChatGPT and Gemini demonstrated capabilities in generating functional modules and persuasive marketing content, ChatGPT consistently outperformed Gemini in terms of code quality, integration ease, and persuasiveness in marketing content. Gemini exhibited variability across its outputs, which may impact user experience and confidence in its reliability for module development and marketing tasks. Both of them then performed similarly in terms of SQL.

Conclusion

This research paper focused on using Artificial Intelligence (AI) in the field of development and management of e-commerce on the PrestaShop platform. Firstly, this paper offers an introduction to the problem then theoretical statements about AI and its tools, E-commerce, and how both AI and E-commerce can be combined in combination. The next part then describes the research methodology and how data will be collected and analyzed. The most important part of the paper is focused on comparing the capabilities of two advanced AI tools—ChatGPT and Google Gemini—in various aspects of e-commerce development, including module creation, marketing content generation, and SQL database management.

The findings indicate that both AI tools offer distinct strengths that cater to different needs within the e-commerce landscape. However, ChatGPT consistently outperformed Google Gemini in several key areas. It excelled in generating coherent, engaging marketing content, providing a user-friendly approach for businesses aiming to enhance their customer communication. Its focus on natural language processing enables it to create compelling product descriptions and promotional materials, significantly improving the overall customer experience.

Conversely, while Google Gemini showcased remarkable versatility with its multimodal capabilities, allowing it to handle diverse data types and generate complex outputs, it demonstrated variability across its results. This inconsistency often required additional manual intervention, making it less reliable for tasks that demand precision. Although Gemini can integrate real-time information and process various forms of content, its performance did not match the reliability and effectiveness of ChatGPT in the evaluated tasks.

Despite the advantages presented by each tool, the research also highlights notable limitations. While both AI tools can automate many aspects of e-commerce development, they are not devoid of errors and may require human oversight to ensure accuracy and relevance. Moreover, the lack of extensive comparative studies in the existing literature emphasizes the need for further exploration into how different AI tools can be integrated into specific e-commerce platforms to maximize their potential.

In conclusion, as AI technology continues to evolve, its role in e-commerce will undoubtedly expand, offering businesses innovative solutions to enhance efficiency and improve customer engagement. By understanding the unique capabilities of tools like ChatGPT and Google Gemini, e-commerce professionals can better leverage these technologies to create more effective online stores and adapt to the ever-changing digital marketplace. Future research should aim to fill the gaps identified in this study, particularly in exploring the comparative effectiveness of various AI tools across different e-commerce platforms, ultimately contributing to a more nuanced understanding of AI's impact on the industry.

The AI analysis of ChatGPT and Gemini has highlighted significant differences in their capabilities across module development, marketing content generation, and SQL query formulation within the context of PrestaShop. Both AI systems exhibited strengths and weaknesses that can inform users when selecting tools for specific tasks.

In module development, ChatGPT consistently demonstrated superior code quality and readability. Its outputs require minimal manual intervention, facilitating a seamless integration process into PrestaShop. In contrast, Gemini's initial output varied in quality, necessitating considerable adjustments before the integration could occur. This discrepancy highlights ChatGPT's more reliable performance in generating functional and easily adaptable code.

When it comes to marketing content generation, ChatGPT again outperformed Gemini. Its content was not only grammatically accurate but also persuasive and structured optimally for clarity and engagement. The friendly tone and effective use of bullet points in ChatGPT's descriptions enhanced their appeal. Conversely, Gemini's output, while initially engaging, lacked consistency in tone and structure, which may undermine its effectiveness in capturing customer attention.

SQL query generation was produced syntactically correctly by both AI systems, however, they shared a common issue with incorrect database prefixes for the specified PrestaShop version. ChatGPT's queries often incorporated subqueries for more refined filtering, which, while complex, contributed to accuracy. Gemini, on the other hand, favored simpler queries that, while readable, risked compromising reliability due to insufficient filtering of order states.

Summarized, while both ChatGPT and Gemini exhibited valuable capabilities, ChatGPT emerged as the more effective tool for module development, marketing content creation, and SQL query formulation. Users seeking a reliable, user-friendly solution for PrestaShop tasks

may find ChatGPT to be the preferable option, given its consistent performance and quality across various criteria. Both tools appear to be considerable viable options for e-commerce development and management with non-negligible further potential with their dynamic development in mind.

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