

Exploring the Use of ChatGPT 3.5 in the Development of *Rootine* Website Front End

Bima Julian Mahardhika *

Software Engineering Technology Study Program, Faculty of Vocational School, IPB University, Bogor City, West Java Province, Indonesia.

Corresponding Email: bimajm7bima@apps.ipb.ac.id.

Tiara Ariyanto Putri

Software Engineering Technology Study Program, Faculty of Vocational School, IPB University, Bogor City, West Java Province, Indonesia.

Email: 3007tiara@apps.ipb.ac.id.

Cahya Rudiansyah

Software Engineering Technology Study Program, Faculty of Vocational School, IPB University, Bogor City, West Java Province, Indonesia.

Email: cahyarudiansah@apps.ipb.ac.id.

Amata Fami

Software Engineering Technology Study Program, Faculty of Vocational School, IPB University, Bogor City, West Java Province, Indonesia.

Email: amatafami@apps.ipb.ac.id.

Irma R.G Barus

Software Engineering Technology Study Program, Faculty of Vocational School, IPB University, Bogor City, West Java Province, Indonesia.

Email: irmabarus@apps.ipb.ac.id.

Received: May 15, 2024; Accepted: July 10, 2024; Published: August 1, 2024.

Abstract: This study aims to investigate and assess the capabilities of ChatGPT. This chatbot communicates with people using artificial intelligence (AI) and can help with various activities. This study looks at how ChatGPT may help with the front-end development of the Rootine farmer helper website for Trinity Company. Through qualitative descriptive methodologies and practical investigation of ChatGPT, this study discovered that ChatGPT's response time to requests may have been enhanced. This is because the version of ChatGPT AI being used, the requirement for more user comprehension in request delivery, and restrictions on replying to requests based on the outcomes of prior answers are the causes of this. This study is anticipated to add to the most recent research on ChatGPT's capacity to assist front-end development.

Keywords: ChatGPT; Artificial Intelligence; Front-End Development; Web Programming.

1. Introduction

Exploration is the process of completely and in-depth learning something new or experiencing something. The development of ChatGPT is one example of technological exploration. OpenAI, a research laboratory firm, developed ChatGPT. A robot or chatbot called ChatGPT (Generative Pre-trained Transformer) uses artificial intelligence (AI) to communicate with people and help them with different activities. Many people are astounded by ChatGPT's responses since they appear well-structured, have clear word or phrase relationships, are quite accurate, and can recall past talks [1][2][3][4].

The front end connects the user to the back end system; typically, it is a user interface where the user interacts with the system [5]. According to Aslamiya *et al.* [6], front-end is a term that refers to developers who work in the layout design section of a website or application; a front-end developer will work on the user interface so that the design looks appealing and not dull to look at. A front-end developer has to master HTML, CSS, Javascript programs, and frameworks like jQuery, Bootstrap, and so forth.

Because ChatGPT can deliver answers and information quickly and pertinently, it can be a valuable tool for helping farmers manage their properties more effectively. Therefore, ChatGPT's use in web development—particularly when it comes to agriculturally-focused apps like Routine— In Semester 3 of the IPB Vocational School Software Engineering Study Program, a group under the name of Trinity Company developed the website Routine to assist farmers in routinely monitoring and supervising their fields. Routine offers a variety of artificial intelligence (AI)-powered agricultural solutions in the hopes that these efforts would result in a bountiful crop. The app's primary goals are to assist users in resolving various agriculture-related issues and offer advice on the crops they are cultivating.

Prior studies have looked into how ChatGPT may help with front-end development. According to research by Tribethran *et al.* [7], the majority of participants (more than 60%) out of a total of 23 participants felt that using ChatGPT as an AI chatbot example and accompanying media significantly improved students' comprehension of programming and the introduction of artificial intelligence. This is what happens when you use ChatGPT to finish programming. Further research by Mutaqin *et al.* [8] discovered that the majority of students (80% in class 6A and 20% in class 6B) concur that using ChatGPT (AI) fosters programming creativity. Similar to the findings of earlier research, the authors of this study aimed to find out how effectively ChatGPT could be a valuable tool to support programming. This research intends to investigate further the use of ChatGPT in building the farming system website Routine and provide a new contribution to the scientific literature in this sector, considering previous experiments' positive and negative outcomes.

Even if earlier studies have shown how ChatGPT can enhance programming comprehension and creativity, there is still a knowledge vacuum about how ChatGPT 3.5 can be used for web development in the real world [8]. Research on learning programming has been done in the past [7], but it has yet to look into using ChatGPT 3.5 in the context of actual web development. By investigating the application of ChatGPT 3.5 in web development through a case study applied to the Routine web development project, this research seeks to close this gap.

When building the Routine website, Trinity Company frequently ran into the following issues: incorrect programming code or needing to know how to create the necessary elements for a web page. Trinity Company so often used ChatGPT to assist them in resolving these web development issues. The selection of ChatGPT can be attributed to its artificial intelligence model, which is capable of emulating human responses and interactions. Trinity Company can acquire answers, ideas, and clarifications regarding web programming issues rapidly by using ChatGPT. Furthermore, ChatGPT can offer innovative suggestions for web application development and assist in comprehending complex subjects. The efficacy and appropriateness of using ChatGPT to accomplish these objectives must be determined. The study's primary concern is whether ChatGPT can resolve problems with Routine website programming.

This study is crucial to analyzing how ChatGPT might be used to develop the Routine website, which serves as a farmer's helper. It will contribute to our knowledge of ChatGPT's usefulness as a tool for troubleshooting web programming issues. By analyzing the advantages and drawbacks of utilizing ChatGPT in this particular setting, this study will offer a more comprehensive understanding of the technology's potential to facilitate the creation of websites.

This study aims to investigate and assess how Trinity Company may use ChatGPT to help develop the Routine Farmer Assistant website's front end. The primary goal was to determine ChatGPT's effectiveness in assisting Trinity Company in overcoming its challenges while building the application's front end. Furthermore, this study aimed to comprehend the use of ChatGPT and determine the advantages and disadvantages of this technology for front-end development. As a result, this study offers a more profound comprehension of

ChatGPT's efficacy in facilitating web programming learning in a classroom setting. It establishes a foundation for future research into more successful learning methodologies.

2. Research Method

This study adopts a qualitative descriptive approach to evaluate the application of OpenAI's ChatGPT 3.5 language model in developing the Rootine website's front end. Data was collected through systematic interactions with ChatGPT 3.5, focusing on the web development outputs generated by the model. These outputs were then analyzed to assess their accuracy and relevance. The research process began with clearly defining the study's objectives and scope. The initial phase involved establishing that the focus would solely be on the front-end development of the Rootine website, which is designed to assist farmers in managing their fields more effectively. This clear focus ensured that the research remained aligned with its specific goals. In the second phase, data was collected by engaging with ChatGPT 3.5 to obtain relevant programming outputs. Each interaction with ChatGPT was meticulously documented, and the resulting outputs, such as programming code and development suggestions, were carefully analyzed. This phase aimed to gather sufficient data to evaluate the effectiveness of ChatGPT 3.5 in assisting front-end development tasks.

The third phase involved data analysis, where the interactions and outputs from ChatGPT 3.5 were assessed qualitatively. The study sought to identify patterns, challenges, and opportunities for improvement in the model's performance. This phase provided insights into the strengths and limitations of ChatGPT 3.5 in generating relevant and functional web development outputs. Following the analysis, a human-centred design evaluation was conducted through interviews with representatives from Trinity Company, the developers of the Rootine website. This evaluation focused on the usability and practical application of the code and suggestions provided by ChatGPT. Finally, the analysis and evaluation findings were presented in a narrative format. This stage involved summarizing the study's outcomes and offering recommendations for improving the use of ChatGPT 3.5 in similar web development projects. These steps helped me understand the role and potential of ChatGPT 3.5 in front-end development..

3. Result and Discussion

3.1 Results

The front end of the plant page is referred to as the Rootine website, which will be discussed. There are cards on this page featuring pictures, names, and descriptions of plants. The output of the plant page on the completed Rootine website is summarized as follows:

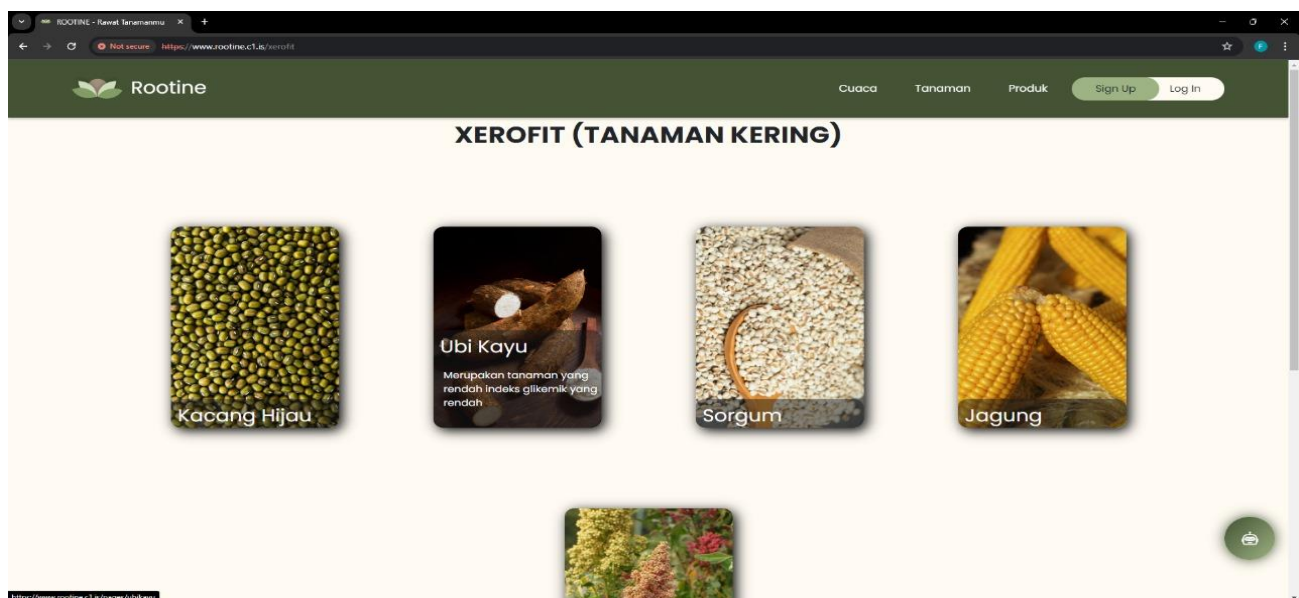


Figure 1. Plant Page on the Rootine Website

The above picture is from Routine's page on dried plants. We will extensively test the application of chatGPT to create a website's front end using the aforementioned resources.

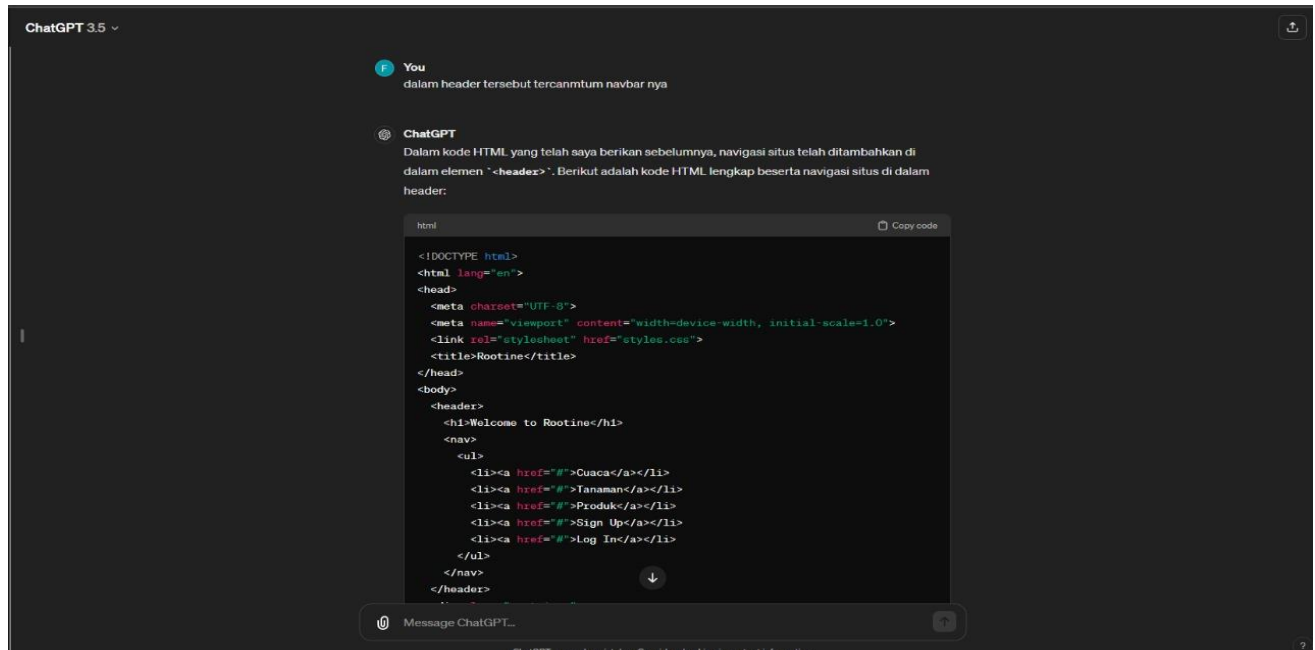


Figure 2. Output Request HTML Code from ChatGPT

Because the programming code given is HTML (Hypertext Markup Language), the code above results from a request to ChatGPT to generate a basic design for the Routine plant page. All HTML document file names end in html or htm. HTML is a text document that may be read for publishing on the World Wide Web (WWW). In light of the expert opinions previously mentioned, HTML is a very suitable language for information display on Web pages because it allows for the organization of information's appearance through a set of commands supported by the language. As its name suggests, HTML uses markup to indicate the commands it uses to display information [9][10][11]. The navigation bar header and the Routine page title are created using the HTML code. The website's information display structure and the link system that facilitates site navigation are combined navigation [12].

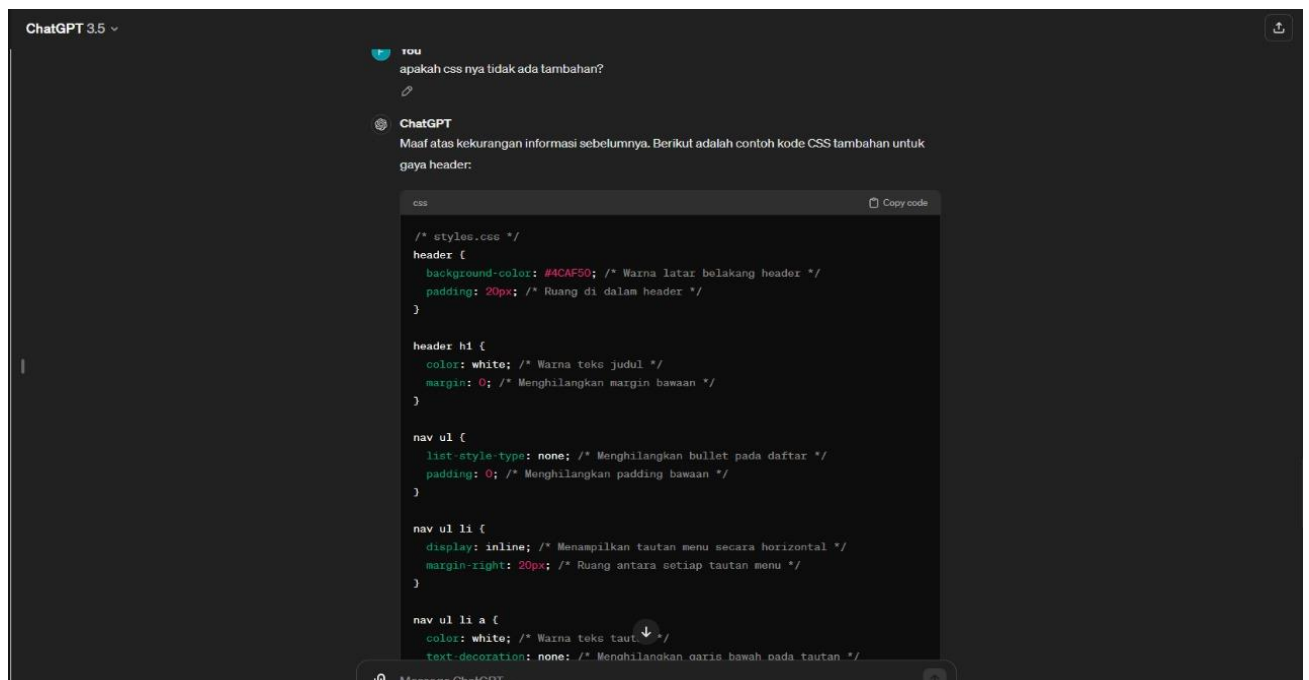


Figure 3. Output Request CSS Code from ChatGPT

The code picture above is the outcome of a request made to ChatGPT to use CSS (Cascading Style Sheet) programming code to embellish and modify the preceding HTML program code's display style. One programming language called Cascading Style Sheet (CSS) is used to arrange and embellish the display style, or layout, of web pages in order to make them look more sophisticated and appealing. As a separate document, CSS may be used by HTML for establishing styles, or it can be integrated in the HTML code [13].

```

<p class="text-justify">Scanfcode.com <i>CODE WANTS TO BE SIMPLE </i> is an
</div>
<div class="col-xs-6 col-md-3">
  <h6>Categories</h6>
  <ul class="footer-links">
    <li><a href="http://scanfcode.com/category/c-language/">C</a></li>
    <li><a href="http://scanfcode.com/category/front-end-development/">UI Des
    <li><a href="http://scanfcode.com/category/back-end-development/">PHP</a>
    <li><a href="http://scanfcode.com/category/java-programming-language/">Ja
    <li><a href="http://scanfcode.com/category/android/">Android</a></li>
    <li><a href="http://scanfcode.com/category/templates/">Templates</a></li>
  </ul>
</div>
<div class="col-xs-6 col-md-3">
  <h6>Quick Links</h6>
  <ul class="footer-links">
    <li><a href="http://scanfcode.com/about/">About Us</a></li>
    <li><a href="http://scanfcode.com/contact/">Contact Us</a></li>
    <li><a href="http://scanfcode.com/contribute-at-scanfcode/">Contribute</a>
    <li><a href="http://scanfcode.com/privacy-policy/">Privacy Policy</a></li>
    <li><a href="http://scanfcode.com/sitemap/">Sitemap</a></li>
  </ul>
</div>
</div>
<hr>
</div>
<div class="container">
  <div class="row">
    <div class="col-md-8 col-sm-6 col-xs-12">
      <p class="copyright-text">Copyright &copy; 2017 All Rights Reserved by
      <a href="#">Scanfcode</a>.
    </p>
  </div>

```

Figure 4. Output Request HTML Code for Footer from ChatGPT

```

/* styles.css */

/* Footer styling */
.site-footer {
  background-color: #26272b;
  padding: 45px 0 20px;
  font-size: 15px;
  line-height: 24px;
  color: #737373;
}
.site-footer hr {
  border-top-color: #bbb;
  opacity: 0.8;
}
.site-footer hr.small {
  margin: 20px 0;
}
.site-footer h6 {
  color: #fff;
  font-size: 16px;
  text-transform: uppercase;
  margin-top: 5px;
  letter-spacing: 2px;
}
.site-footer a {
  color: #737373;
}
.site-footer a:hover {
  color: #3366cc;
  text-decoration: none;
}
.footer-links {

```

Figure 5. Output Request CSS Code for Footer from ChatGPT

Requests to chatGPT to create a footer result in the code seen above. In the form of website information, the footer is shown at the bottom to enhance the layout [14]. Add a little programming code with HTML and CSS to create a square and some coordinating footer text.

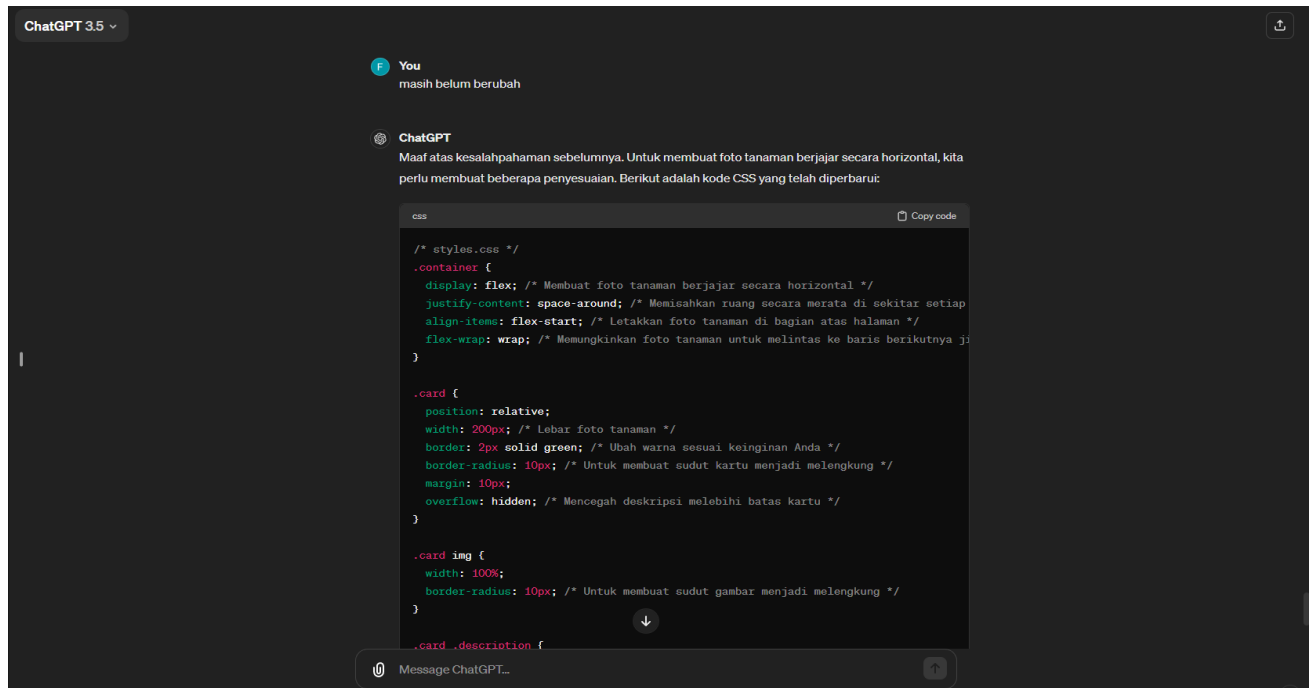


Figure 6. Error Output Code Request from ChatGPT

Sometimes ChatGPT doesn't react correctly thus, you must send a repeat request. Additionally, ChatGPT can offer an output or response code that, when applied, maintains its original location. When a user requests ChatGPT, they may not grasp the aforementioned ChatGPT criteria. When ChatGPT is fully utilized on the Routine website plant page, the following result is produced:

Welcome to Routine

- [Home](#)
- [Tanaman](#)
- [Produk](#)
- [Sign Up](#)
- [Log In](#)



Kentang

Deskripsi tanaman Kentang



Jagung

Deskripsi tanaman Jagung

Figure 7. The Final Result of The ChatGPT Programming Code Output



Figure 8. The Final Result of The ChatGPT Programming Code Output

The programming results above display the Rootine website plant page with a fully working version of ChatGPT. As previously mentioned, there are instances in which ChatGPT may not react appropriately or to user demands. There are several reasons for this, such as the user's inability to adequately describe requests to ChatGPT and the ChatGPT AI version, which employs a default response to requests. Also, ChatGPT is frequently constrained by the outcomes of earlier operations. Supriyadi *et al.*'s study statement [14] states that clearing away the previous conversation or starting a new one is crucial to ensuring that it is unaffected by the earlier directives. Additionally, as stated in Setiawan's study statement [15], Chat GPT occasionally generates incorrect or inappropriate responses, particularly when given ambiguous or confusing input. Both the final Rootine plant page and the Rootine page created by ChatGPT demonstrate how working with ChatGPT may produce an easy-to-understand plant page.

3.2 Discussion

The findings from this study illustrate both the strengths and challenges of utilizing ChatGPT 3.5 in developing the front end of the Rootine website. The evaluation of the outputs provided by ChatGPT 3.5 offers important observations about its effectiveness in this specific application. One of the primary strengths identified is ChatGPT 3.5's ability to generate basic programming code, including HTML and CSS, which can be highly beneficial for web developers. The AI model successfully produced code snippets that adhered to standard programming practices, enabling the developers at Trinity Company to quickly create and refine various components of the website's front end. For example, the code generated for the navigation bar, footer, and plant page layout proved functional and helped establish a visually pleasing and well-structured user interface. This demonstrates that ChatGPT can significantly contribute to increasing efficiency during the initial web design and development stages.

However, the study also highlights certain limitations when relying on ChatGPT 3.5 for more complex programming tasks. One key issue encountered was the occasional generation of incorrect or incomplete code, notably when the AI received ambiguous or unclear prompts. This indicates that while ChatGPT 3.5 can handle straightforward tasks, its performance may falter when dealing with more intricate requirements. For instance, some errors were observed in the code for interactive elements on the website, which required manual adjustments by the developers. This limitation emphasizes the importance of human oversight when using AI tools like ChatGPT in professional web development.

Additionally, the study found that iterative requests to ChatGPT often resulted in repetitive or redundant code, complicating the development process. Developers needed to refine their prompts and restart interactions to achieve the desired results, highlighting that the current version of ChatGPT lacks the adaptability necessary for seamless integration into ongoing development workflows. This repetition issue suggests a need for improved algorithms that can better understand and build upon previous interactions without producing redundant outputs. Feedback from the human-centred design assessment gathered through interviews with representatives from Trinity Company also provided valuable insights into the practical use of

ChatGPT 3.5. While the AI was acknowledged for its ability to generate basic code quickly, there were concerns about its limitations in interpreting and delivering more advanced design requirements. The developers noted that while ChatGPT was useful for developing initial ideas and code structures, it often needed to improve in offering solutions that fully aligned with the project's specific needs, particularly in areas requiring customization and user experience optimization. This study reveals that ChatGPT 3.5 is a valuable tool with the potential to streamline certain aspects of web development, particularly during the early stages. However, its limitations mean that it can only partially replace the expertise of human developers. The findings suggest that ChatGPT is most effective alongside human developers who can guide and refine its outputs. As AI technology progresses, future versions of ChatGPT may address some of these limitations, potentially leading to even greater integration in the web development process.

4. Related Work

The development and application of artificial intelligence (AI) in various domains have garnered significant attention in recent years, with ChatGPT, a model developed by OpenAI, being one of the notable advancements. Previous studies have explored the use of ChatGPT in educational settings, programming tasks, and its role in enhancing user interaction across different platforms. Tribethran *et al.* (2023) investigated the impact of using ChatGPT as an instructional tool in programming education. Their study revealed that more than 60% of the participants believed that the integration of ChatGPT in the classroom significantly improved their understanding of programming concepts and artificial intelligence. This research highlights the potential of ChatGPT to facilitate learning and comprehension in technical subjects, providing a foundation for its application in more specialized areas such as web development [7]. Similarly, Mutaqin *et al.* (2024) examined the influence of ChatGPT on creativity and motivation among students learning programming. Their findings showed that the majority of students recognized the AI's role in fostering creative problem-solving skills, particularly in generating new ideas and approaches to coding challenges. The ability of ChatGPT to stimulate creativity suggests its potential to support developers in generating innovative solutions during the web development process [8].

In addition to educational settings, research has also focused on the practical application of AI tools like ChatGPT in real-world development scenarios. Supriyadi *et al.* (2022) explored the challenges and opportunities associated with using ChatGPT for writing educational content, noting that while the AI demonstrated strong capabilities in generating text, it also encountered difficulties with context-specific requirements and producing content that fully met user expectations. This study underscores the importance of understanding the limitations of AI tools in practical applications, a theme that resonates with the findings of the present study [15]. Furthermore, Setiawan and Luthfiyani (2023) discussed the implications of ChatGPT in educational settings, particularly in enhancing students' writing skills. Their research suggested that ChatGPT could serve as an effective assistant in the writing process, helping users structure their work more effectively. However, they also noted that the AI's responses were sometimes generic, which limited its effectiveness in producing high-quality academic content [4]. These studies collectively highlight the growing interest in leveraging AI technologies like ChatGPT across different domains. They provide a foundation for further exploration into the application of ChatGPT in web development, as conducted in the present study. While prior research has focused primarily on educational and content generation contexts, this study extends the investigation into the practical utility of ChatGPT 3.5 in real-world development tasks, specifically in the front-end development of a web application.

5. Conclusion

This qualitative descriptive research aims to investigate and assess how Trinity Company used ChatGPT to help develop the Routine Farmer Assistant website's front end. To illustrate ChatGPT's artificial programming code output, this study gathers a sample of programming code data and runs it through the Visual Studio Code software on Chrome. The artificial programming code outputs of ChatGPT have a lot of restrictions and variations. Two examples are the shapeless plant map part and the front-end display, which still needs improvement in navbars. These flaws limit an AI ChatGPT's ability to process user requests. This is closely related to earlier research that shows ChatGPT's look has limits. The findings of this study may be used as a tool by ChatGPT developers to create the Routine website's plant pages. ChatGPT was created using the Reinforcement Learning from Human Feedback (RLHF) approach. It can reply to nearly any word or phrase

typed into it, but it won't answer queries deemed unlawful or violent. But keep in mind that ChatGPT has use restrictions and cannot ensure that user inquiries are responded to completely accurately.

References

- [1] Nurina, A. D., & Indrawati, D. (2021). Eksplorasi etnomatematika pada Tari Topeng Malang sebagai sumber belajar matematika sekolah dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 9(8), 3114–3123. Retrieved from <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/42329>
- [2] Ramadhan, F. K., Faris, M. I., Wahyudi, I., & Sulaeman, M. K. (2023). Pemanfaatan ChatGPT dalam dunia pendidikan. *Jurnal Ilmiah Flash*, 9(1), 25. <https://doi.org/10.32511/flash.v9i1.1069>
- [3] H.I.A, P. (2023). Implementasi penggunaan media ChatGPT dalam pembelajaran era digital. *Journal of Educational and Cultural Studies*, 2(2), 1–8. Retrieved from <https://jurnal.litnuspublisher.com/index.php/jecs/article/download/156/163>
- [4] Setiawan, A., & Luthfiyani, U. K. (2023). Penggunaan ChatGPT untuk pendidikan di era Education 4.0: Usulan inovasi meningkatkan keterampilan menulis. *Jurnal Petisi (Pendidikan Teknologi Informasi)*, 4(1), 49–58. <https://doi.org/10.36232/jurnalpetisi.v4i1.3680>
- [5] Arhandi, P. P. (2016). Pengembangan sistem informasi perijinan tenaga kesehatan dengan menggunakan metode back end dan front end. *Jurnal Teknologi Informasi*. <https://doi.org/10.36382/jti-tki.v7i1.192>
- [6] Aslamiyah, S., & Kusumas Sita, Y. (2019). Membangun aplikasi front-end pelayanan petugas bank sampah. *SNPMas: Seminar Nasional Pengabdian Pada Masyarakat*, 111–118. Retrieved from <https://ejournal.diponegara.ac.id/index.php/snpmas/article/view/435>
- [7] Tribethran, S., Daniel, D., Ferdynand, R., Saputra, A., Hansen, H., & Pribadi, M. R. (2023). Pelatihan pemrograman dasar Python dengan memanfaatkan ChatGPT pada SMK Methodist 2 Palembang. *Jumat Informatika: Jurnal Pengabdian Masyarakat*, 4(2), 71–79.
- [8] Mutaqin, R., Endrawati Subroto, D., & Warman, C. (2024). Analisis penggunaan Chat GPT (AI) dan modul pemrograman terhadap motivasi belajar dan kreativitas mahasiswa dalam mata kuliah pemrograman pada program studi Pendidikan Teknologi Informasi, Universitas Bina Bangsa. *Jurnal Sainifik (Multi Science Journal)*, 22(1), 1–8. <https://doi.org/10.58222/js.v22i1.214>
- [9] Ahdan, S., Priandika, T., Andhika, F., & Amalia, F. S. (2020). Perancangan media pembelajaran teknik dasar bola voli menggunakan teknologi augmented reality berbasis Android. *Education*, 8(3), 1–16. Retrieved from <http://journalbalitbangdalampung.org>
- [10] Setiawan, A., & Pasha, D. (2020). Sistem pengolahan data penilaian berbasis web menggunakan metode PIECES (Studi kasus: Badan Pengembangan Sumber Daya Manusia Provinsi Lampung). *Jurnal Teknologi dan Sistem Informasi (JTSI)*, 1, 97–104. Retrieved from <http://jim.teknokrat.ac.id/index.php/sisteminformasi>
- [11] Samsugi, S., Nurkholis, A., & Andika, T. A. (2021). Digitalisasi sistem peminjaman buku pada SMK Negeri 2 Kalianda Lampung Selatan. *Journal of Technology and Social for Community Service (JTSCS)*, 2(2), 128–138. Retrieved from <https://ejournal.teknokrat.ac.id/index.php/teknobdimas>
- [12] Al Husna, H. I., & Nafisah, S. (2019). Analisis elemen kunci website berdasar konsep Shedroff pada website perpustakaan Universitas Islam Indonesia. *UNILIB: Jurnal Perpustakaan*, 10(1). <https://doi.org/10.20885/unilib.vol10.iss1.art1>
- [13] Noviana, R. (2022). Pembuatan aplikasi penjualan berbasis web Monja Store menggunakan PHP dan MySQL. *Jurnal Teknik Dan Science*, 1(2), 112–124. <https://doi.org/10.56127/jts.v1i2.128>

-
- [14] Hafizd, K. A., & Sayyidati, R. (2017). Sistem informasi perpustakaan Politeknik Negeri Tanah Laut. *Jurnal Sains Dan Informatika*, 3(2), 60–67. <https://doi.org/10.34128/jsi.v3i2.72>
- [15] Supriyadi, E. (2022). Eksplorasi penggunaan ChatGPT dalam penulisan artikel pendidikan matematika. *Papanda Journal of Mathematics and Science Research*, 1(2), 54–68. <https://doi.org/10.56916/pjmsr.v1i2.255>
- [16] Setiawan, D., Karuniawati, E. A. D., & Janty, S. I. (2023). Peran ChatGPT (Generative Pre-Training Transformer) dalam implementasi ditinjau dari dataset. *INNOVATIVE: Journal of Social Science Research*, 3(3), 9527–9539. Retrieved from <https://j-innovative.org/index.php/Innovative/article/view/3286>.