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Approaches to enhance user experience and satisfaction with the design of the ComplaintCraft system: A study on its features and objectives

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Abstract. The complaint letter is significant in interpersonal communication and feedback. To many individuals, particularly those with limited experience and expertise in letter writing, it remains a significant challenge to effectively express their emotional complexity. Consequently, many individuals choose not to voice their concerns and emotions. To address this issue, we conducted 3 iterations to formulate ComplaintCraft—an innovative system that enables users to interactively customize and generate complaint letters with the help of ChatGPT: (i) Conducting a survey with 63 staff members to determine their specific requirements and preferences about complaint letter. (ii) Co-designing a low-fidelity prototype with three students, based on their feedback, gleaning valuable insights, refining interfaces, and sequentially inputting formulation. (iii) Evaluating the user experience of the initial system of ComplaintCraft in different real-world cases with six individuals who intended to file complaints in the near future, gaining detailed insights into which feature in ComplaintCraft is helpful in addressing their real-world issues when composing complaints and what problems exist in the initial system. The initiative's ultimate goal is to enhance the usability of AI writing tools and encourage users to express themselves with confidence.

Keywords: User-centered design, system design, Natural language model.

1. Introduction

1.1. Letters

For centuries, letters have played a significant role in human communication. From renowned figures to ordinary individuals [1], people have expressed their thoughts and emotions by penning down heartfelt words. Parents have written extensive letters to their children to impart wisdom about life. Revolutionaries have used the power of words on torn pieces of paper to create enormous wealth. Even spies have relied on covert notes in order to hold valuable information. For us citizens, we preserve our legal rights from those who treated us improperly by writing complaint letters. We also use complaint

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letters as a form of feedback to certain products or organizations, well, the majority of them are usually negative comments.

However, it can be intimidating to write a complaint letter for the first time. It is essential to maintain a direct and respectful tone and to avoid incoherent ranting and raving, as this may undermine the credibility of the feedback. Instead, we should concentrate on conveying our concerns in a clear and concise manner and providing pertinent details and evidence to support the complaint. However, one of the difficulties is that written expression is typically so serene and composed. Especially when dealing with significant matters, it may be more effective to collect one's thoughts and words than to simply articulate oneself plainly due to the emotion involved. In addition, it is essential to take effective measures to reduce the frequency of article repetition when expressing intense emotion. To overcome this, it is vital to take a step back, compose one's thoughts, and approach the letter with a calmer mindset. Maintaining composure and discretion when expressing concerns can considerably increase the impact of the complaint resulting in a more effective resolution. People typically pay for ghostwriting, but in addition to financial issues, it is difficult to guarantee the quality of the complaint letter and it may take a while to validate the detail. Consequently, we consider emergent AI technologies.

1.2. Intelligent systems

Generated by Artificial Intelligence are becoming increasingly popularized in our modern life. These systems are commonly referred to as a black box system, [2] where users' input is converted into output transferring through the black box model. With the ability to process and analyze a mass of data quickly, AI could be used in various domains that need to process complex data, such as [3] medical treatment, industrial inspection and insurance risk estimation. Though emotion is hard to express exactly by data, if we add some emotional words when chatting with AI content generators, the tools are able to generate text that resembles human writing closely. Thus, we think it is also highly beneficial for content marketing endeavors.

1.3. Goal

Our primary objective is to develop a user-friendly system utilizing the ChatGPT AI writing tool [4] to assist individuals in efficiently composing complaint letters. We have chosen to focus on this area due to the widespread difficulty of writing complaint letters among individuals who have limited experience and expertise in this domain. By harnessing the power of AI, our system allows users can articulate their concerns with precision and tact, ensuring that their feedback is taken seriously [5]. To achieve this goal, as shown in Figure 1, we started a survey, which informed a user-centered design to formulate ComplaintCraft-a system for users to interactively custom-make and form a complaint letter, generated by ChatGPT.

To create this system, as shown in Figure 1, we started with a survey, which can help us to identify users' requirements and expectations about ComplaintCraft.

Iteration#1: Survey

We surveyed 63 staff members to determine the frequency with which they write complaint letters, the difficulties they face when doing so, and the reason why writing a complaint letter is so difficult for some individuals. In addition, we inquired about their willingness to use a complaint letter writing assistant and encouraged them to provide expectations regarding their particular preferences.

Iteration #2: LOW-FIDELITY PROTOTYPE

The user experiences of using ChatGPT to generate complaint letters were evaluated by three students, and their evaluations helped us to come up with three improvement points, including an inclusive user interface, personalization of output, and reducing users' pressure of input in the system's design formulation.

Iteration 3: HIGH-FIDELITY PROTOTYPE

We developed an initial system for ComplaintCraft and invited six participants who intended to file complaints in the near future to let them use our initial system and give evaluations on the user

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experience. Subsequently, we made improvements to our system as a Hi-Fi Prototype based on the feedback received.

2. Literature review

[6] In the fields of artificial intelligence and machine learning, natural language models have acquired enormous importance. Their primary purpose is to enable machines to comprehend, interpret, and produce human language. These models have vast practical applications, including conversation robots, writing assistants, automatic translation, and medical data analysis. These versatile implementations have increased the significance of natural language models in various disciplines as a result of their adaptability. [7] LLMs are a form of artificial intelligence that can simulate human intelligence. They employ statistical models to analyse immense quantities of data, discovering patterns and relationships between words and phrases. Recently, it has demonstrated superior efficacy on tasks requiring zero or few shots. Users prefer ChatGPT due to its accessibility, grammatical correctness, and human-like responses across multiple domains.

[8] In a mixed-methods study conducted by Moore, Rutherford, and Craw in 2016, the impact of writing assistant tools on writing proficiency among post-secondary students in a Canadian EFL context was investigated. The researchers found that while digital writing tools can enhance writing proficiency, the presence of proper guidance within the writing tool is crucial. Therefore, as system developers, it is essential to incorporate step-by-step guidance to assist users in crafting high-level articles effectively.

[8] In 2021, Perry conducted a comprehensive literature review focusing on digital writing tools for L2 users. The findings from the gathered data highlighted the strong effectiveness of these tools when used in well-structured programs. Notably, the review demonstrated that employing such well-structured tools, particularly for tasks like composing complaint letters, can significantly enhance efficacy. This, in turn, has the potential to increase the impact of the complaint and lead to more effective resolutions.

ITERATION#1: LEARNING ABOUT THE STATUS QUO THROUGH SURVEY QUESTIONS

We conducted a survey to better understand the frequency of writing complaint letters and to identify the challenges they encounter while doing so, also to discover why writing a complaint letter is such complicated to certain people. Additionally, we inquired about their willingness to use a complaint letter writing assistant and encouraged them to provide input on their specific needs.

Survey Design

In order to gain insight about the status quo and to better understand what the users in need, we designed an online questionnaire with 9 questions inside and send it to 63 staff workers in our school.

As part of the survey, staff workers were asked: "What is the biggest challenge you face when writing a complaint letter?" This question aimed to identify the primary difficulties users encounter during the writing process, enabling us to develop relevant functions that cater to their specific needs. Moreover, we inquired, "Do you agree with the assistant using fierce language in your letter?" This question was designed to understand how our system can assist users in tone selection during the generation process, allowing them to adopt different attitudes depending on the situations the user faced. By exploring user preferences in language tone, we aim to create a versatile and adaptable assistant that aligns with users' communication style and requirements in various situations.

Participants

We distributed our survey via our school website and social media app WECHAT. We recruited 63 participants in total. To maintain anonymity, we conducted the survey on the questionnaire star platform (Wen Juan Xing). Upon completion of the survey, each participant received a shopping voucher as a token of appreciation for their valuable input.

Findings

Out of the 63 participants, 58 (92.06%) expressed difficulty in writing complaint letters, leading them to abandon the process due to its complexity. Surprisingly, over 90 percent of the respondents showed a strong desire for an AI writing assistant that could aid them in crafting complaint letters. This

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overwhelming demand for such a system served as a powerful motivation for our team on the design of ComplaintCraft, and further strengthened our determination to develop a highly expected solution.

Interestingly, a significant majority of over 70 percent of the participants (44 out of 63) identified "Conveying the Right Emotion and Tone in the Letter" as their biggest challenge in complaint letter writing. This finding has highlighted the necessity of incorporating a tone selection feature into the system, which will be invaluable in assisting users to generate well-balanced and appropriate letters.

Moreover, a staggering 90.48% of the respondents (57 out of 63) expressed their wish for ComplaintCraft to automatically generate a complaint letter promptly, thus eliminating the time-consuming process of manual writing and typing. This insight emphasizes the importance of including a "Time-Saving" characteristic in the system's functionality.

With these valuable insights from the survey, our team is more determined than ever to design and develop ComplaintCraft as a comprehensive and user-friendly complaint letter writing assistant, addressing the specific needs and challenges identified by the participants.

Table 1. Statistic data of the survey

Question 2: Did you ever give up to complain just because it too complex?		
Options	Subtotal	Ratio
Yes	58	92.06%
No (briefly why)	2	3.17%
Have not encountered this type of problem	3	4.76%
This question is valid to fill in	63	

Question 3: What do you think is the biggest challenge in writing a complaint letter? (Multiple choice)		
Options	Subtotal	Ratio
Find the right words to express dissatisfaction	34	53.97%
Organizational structure and logical arrangement	39	61.9%
Convey the right emotion and tone in your letter	46	73.02%
Make sure the letter of complaint has the necessary information and details	43	68.25%
Other (please specify)	1	1.59%
This question is valid to fill out	63	

Question 5: What help do you expect an AI complaint writing assistant to provide? (Multiple choice)		
Options	Subtotal	Ratio
Provide templates and examples for writing a complaint letter	31	49.21%
Provide relevant words and phrases to express grievances and complaints	37	58.73%
Generate the required complaint letter directly	57	90.48%
Other (please specify)	0	0%
This topic is valid to fill in	63	

Question 8: If you use an AI complaint assistant, which form do you prefer?		
Options	Subtotal	Ratio
Web pages	55	87.3%
Application	8	12.7%
The number of times this question is valid to fill	63	

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ITERATION#2 LOW-FIDELITY PROTOTYPE TO FORMATIVE KEY SYSTEM

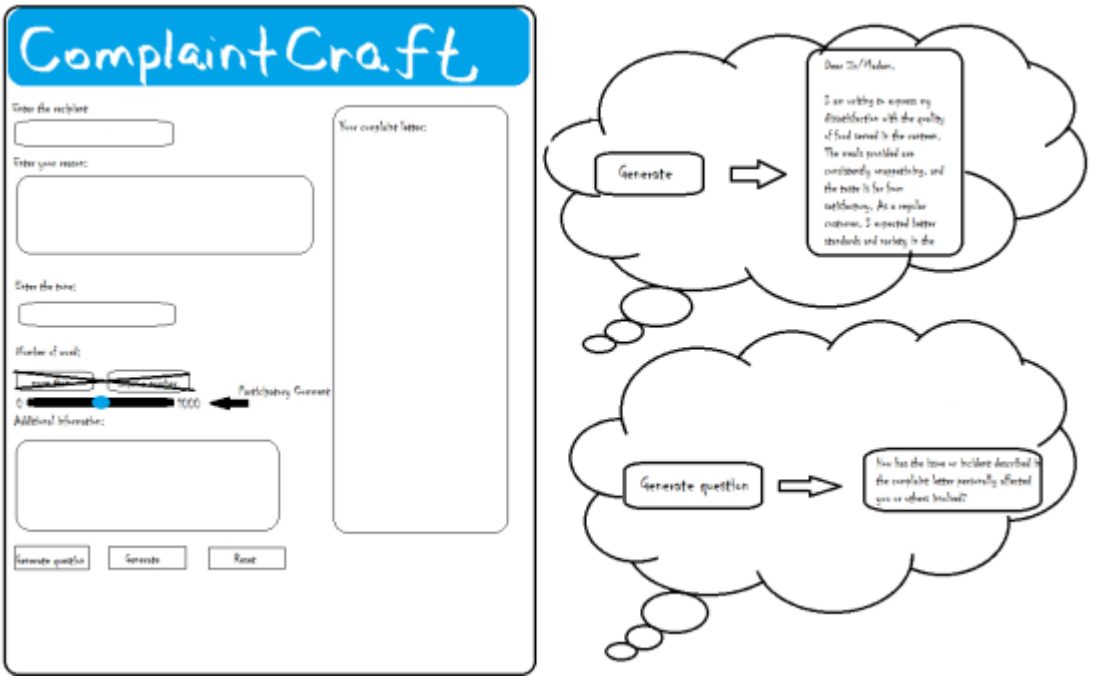

Figure 1. Low-fi prototype, co-designed with three participants in Iteration #2.

Based on the survey's findings that point to the system's requirements, we investigated the user's experience of using chatgpt. In this section, we designed a low-fidelity prototype of the system with three participants' evaluations.

Participants

Three students who had experience writing complaint letters from our research class were selected to participate in our investigation.

Procedures

According to the findings of the survey, we typed a piece of prompt on a computer and asked for the participants to fill in their requirements in the blanks:

"Generate a complaint letter with _____(number of word) words to _____(recipient), because _____(reason).And the tone should be _____. There is some additional information: _____. "

After the three participants filled in their information, we copied this prompt and pasted it into the chatgpt inputting box, then let the AI generate a complaint letter so that the three students can provide us with some feedback and evaluations on their users' experiences and outputs of the letter, which helps improve and mature our user interface.

Results: Key System

Designs Through the evaluations of their entire experiences and the outputted letters of the three students, we had the following functional design for ComplaintCraft.

#1 Inclusive user interface

Two students mentioned that when the input field of chatgpt was too small to display the whole prompt since their inputs included lots of details which made the prompt very long. And they had to scroll up and down again and again in the modification process, which brought them inconvenient user experiences.

Design

As shown in the figure, the input of the main information is in the form of answering questions (the user can simply enter keywords or phrases into the input box) e.g., Recipient, reason, number of words,

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etc. All user input information can be displayed on one page, making all the information unobstructed to recheck and modify.

#2 Personalization

All three participants stated that the complaint letter generated by the chatgpt had a feature of universality due to insufficient input information. And they hoped the complaint letter can contain more detailed and more private information in order to personalize the output. They also mentioned, however, in many cases, the user might not be sure what additional information needs to be entered.

Design

As shown in the figure, after the user has entered the basic information, the system allows the AI to generate up to three additional questions to request information about the letter more detailedly and personally. Similarly, the user also enters the information or expectations in the form of answering questions, so the user will not be puzzled when inputting information.

#3 Reducing users' pressure of input

One participant mentioned that compulsorily requiring inputs will bring pressure on the user and when generating some informal complaint letters, some inputs, like word count and tone are not essential factors for the final output. Forcing the user to fill in all the blanks will reduce freedom and convenience in the user's experience.

Design

The system offers more freedom to users, and they can determine by themselves whether or not to input the information about the letter (except the recipient and the reason) depending on the user's own situation. Meanwhile, it can be protective for users that allowing them not to disclose their private information to the system creating a sense of security for users.

Iteration #3 EVALUATING A HIGH-FIDELITY PROTOTYPE

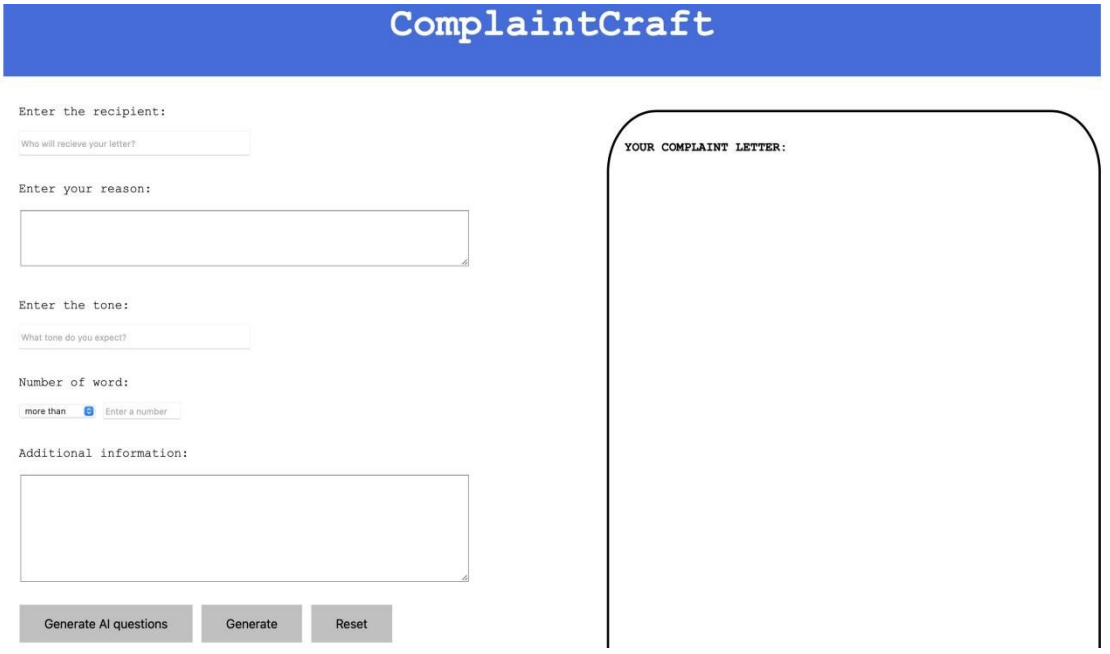

Figure 2. initial webpage of the ComplaintCraft system

We implemented the three functionalities mentioned in Iteration #2 into the back-end system of ComplaintCraft as Figure 3 shows and developed the front-end as a web page which is similar to the low-fidelity prototype for further investigation of users' requirements.

Research question

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Before further investigation, we elicited a research question that whether ComplaintCraft can give the user a satisfactory experience when generating a letter and make the complaint effective in a real-life scenario.

Participants:

We extended invitations to six individuals who had the intention to file complaints in the near future.

Tasks & Procedure

We invited those six participants to try out the ComplaintCraft system and generate a complaint letter to address their real-life situations where they encountered genuine reasons to lodge complaints. After trying out the system, they are also requested to qualitatively appraise and quantitatively rate the overall user experience including the accessibility of the interaction (like the time taken to input their information), quality of the AI-generated letters (whether meets their expectations) and the effectiveness of their complaint (whether they are satisfied with the responses they received after submitting the complaint letters).

Questions

Please rate your level of satisfaction with the accessibility of ComplaintCraft and the quality of the letter on a scale of 1 (very dissatisfied) to 5 (extremely satisfied). And with their consent, we were allowed to inquire about the effectiveness of their complaints in the term of asking them whether the responses or the solutions meet their own expectation or not.

Data collection:

Table 2. Participants' ratings on the features of the system and answers about the effectiveness.

Participants	Accessibility	Quality	Effectiveness (Whether get the response)
P1	**5**	**4**	**Yes**
P2	**4**	**5**	**No**
P3	**5**	**3**	**Yes**
P4	**3**	**4**	**Yes**
P5	**4**	**3**	**Yes**
P6	**5**	**4**	**No**

As Table 2 shown, the ratings of 6 participants on the accessibility of the system and the quality of the output letter and their answers to the question of whether they get responses are displayed on the table.

Analysis

Accessibility of the system: The rating on the accessibility of the ComplaintCraft system has an average figure of 4.3, which is sufficient to prove that our system is user-friendly and able to satisfy the user in terms of human-computer interaction is satisfactory for users. P1, P3 and P6 highly praised the function of AI-generating-question stating that it made it simpler for them to respond to inquiries than to generate bullet points for their letters. But P4 commented on the webpage design mentioning that "The current layout of the web page is like a questionnaire or an examination website, and it will look better if enriching the style of this webpage."

Quality of output: The rating on the quality of the output letter has an average figure of 3.8 which is relatively low compared with the accessibility, but it is still above the 'Medium' level (rating of 3) and almost hit the level of 'Satisfied' (rating of 4). P3 and P6 mentioned that the generated letter included some information that they did not input, which means the AI will guess the user' thought according to their input. And P5 mentioned that the letter generated by AI is verbose and some sentences are redundant because of their similar meanings.

Effectiveness: 4 out of 6 participants (P1, P3, P4, P5) received some responses within 2 days, and all of them acknowledged that the responses they had received could meet their expectations. We shortly took an interview with each of them again asking them to give a conjecture on the factors that may

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influence the effectiveness of the complaint. Those four participants had very similar answers, and they all referred to the input of the tone and number of words. For example, P1 said he thought that the fierce tone and the long length of the letter had an obvious effect on the speed of response and the final solution.

Improvements

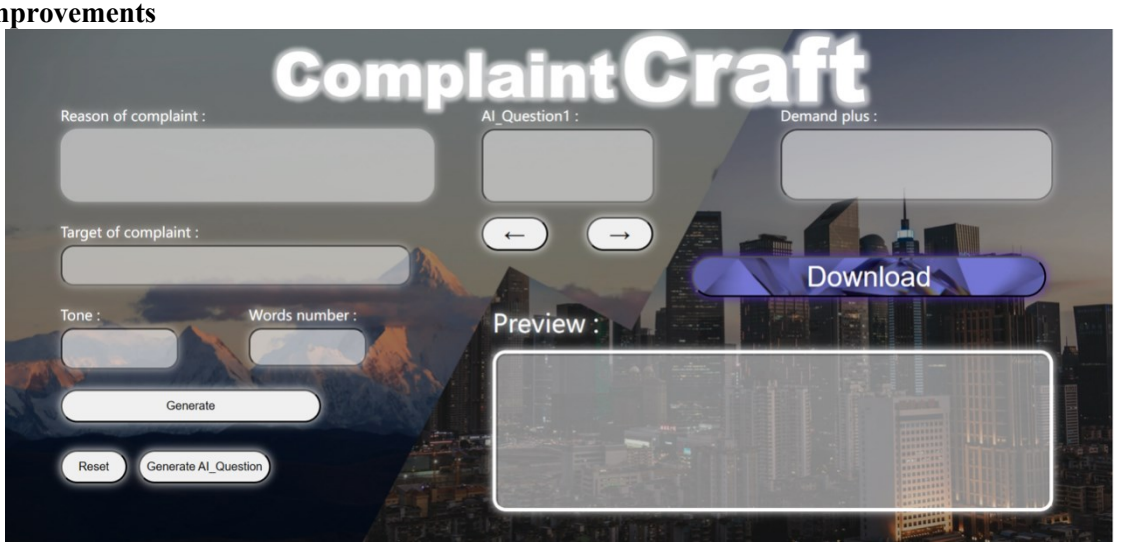

Figure 3. The web design after beautification

—To solve the problem introduced by P4 in the accessibility section, we did some enrichments to the overall layout and style of the web page as the figure shows.

—To solve the problem mentioned by P3, P4 and P6 in the quality section, we showed our code to these participants and told them to focus on the 'generatePrompt' function which creates a prompt and inputs into chatgpt. They gave us several suggestions to modify our initial prompt and all of them agreed to add 'using succinct and logical language' to the prompt to make the logic clearer.

3. Conclusion

In conclusion, the focus of this paper was on the user-centred design methodology and the creation of ComplaintCraft, a system tailored to enhance user experience and satisfaction when filing complaint letters. The objective of the study was to facilitate the writing of complaint letters for the general public. This research contributes to the development of AI writing tools by emphasizing user-centred design and addressing the requirements of staff members. The results indicate that the ComplaintCraft system has the potential to streamline the complaint letter writing process, thereby enhancing user satisfaction. It is suggested that additional research and design be conducted to improve the system and contribute to the field of AI writing tools.

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