AI Chatbots in Design Thinking

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Introduction

In recent years, the integration of artificial intelligence (AI) into various business processes has attracted significant attention[1, 2]. This paper explores the use of generative AI, specifically Large Language Models (LLMs) such as ChatGPT, to improve the Design Thinking (DT) process in business and IT consulting. The primary focus of this paper is on the technical implementation in practice and the insights gained from the integration of AI-based chatbots to facilitate different phases of the design thinking process. The aim is to work out how such technology can inspire and streamline design thinking consultating while addressing potential challenges.

DT has established itself as a systematic, future-oriented problem-solving approach that promotes innovation and creativity by placing the user at the centre of the design process [3–6]. The method is mainly used for the innovation and design of products and services by bundling agile methods and tools [7]. DT is also useful for developing strategies and business models [8, 9], and becoming increasingly popular in areas where digital transformation demands for new skills and competences in creating effective user experiences such as business and IT consulting[10].

However, the consulting process with DT faces various challenges, including the balance between structure and creativity [11]. Developing appropriate DT skills is particularly challenging for less experienced consultants [12], and scalability remains a significant issue due to the intensive customer dialogue required, leading to high personnel costs [13, 14]. This is especially true for small and medium-sized consulting firms [15].

Literature indicates an increasing interest in preparing future designers for human-AI collaboration. Studies such as [16] emphasize the growing need for AI in generating user-centered design artifacts. Additionally, researches on personas [3] and user-stories in the context of user centered design underscores the significance of these tools in DT. However, their potential and limitations in consulting processes have not yet been investigated.

To that end, this paper addresses the research question: *"What challenges can arise when implementing LLM-based chatbots in the DT process of consulting firms?"*

By examining the architecture, prompts, and implementation strategies used to develop an AI-driven DT assistant, the study aims to uncover technical and procedural obstacles and provide insights into overcoming them. The design and implementation process revealed several challenges, including the need for precise prompt engineering to ensure relevant and coherent outputs, handling the variability in AI responses, and ensuring data privacy and security. Additionally, the study found that while it is possible to generate high-quality personas and user stories using the LLM-based chatbot, it requires careful tuning of parameters such as temperature and frequency penalty to optimize performance.

We present an approach that automates parts of the DT process, guiding customers through a consulting session that generates actionable personas and user stories without requiring prior training. This enables firms to conduct consulting with a large number of participants without facing capacity constraints.

Our findings indicate that LLM-based chatbots offer significant advantages over traditional human DT consulting, notably in the accelerated and efficient generation of personas and user stories, leading to considerable time savings. While the quality of the generated content can be improved, LLMs provide a valuable source of inspiration and a means of capturing diverse perspectives. Despite concerns about direct communication between customers and chatbots, intuitive and guided DT sessions with chatbots can produce actionable results.

A key benefit of integrating LLM-based chatbots into the DT process is the substantial cost efficiency, as chatbots significantly reduce the time and associated personnel costs compared to the relatively low cost of API access.

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