# AN EXPERIENTIAL REFLECTION ON DECISION-MAKING USING AI-AHP: THE CASE OF A COMPANY IN THE TEXTILE AND FUR CLEANING INDUSTRY

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## Highlights

- To discuss the experience of using a hybrid AI-AHP approach within the context of a decision-making college course.
- To propose a tentative decision model to address the case at hand.

### ABSTRACT

Working on structuring a strategic decision-making problem in the textile industry provided an opportunity to experience two approaches to structure the decision model: the traditional one (interviews, surveys, and literature review) using the Analytic Hierarchy Process (AHP) and a hybrid approach, using artificial intelligence (AI), more specifically ChatGPT, to validate/modify the original model.

**Keywords:** AI for problem structuring, AI-AHP experience, AI benefits, AI challenges.

## 1. Introduction

The development of AI has influenced research practices, including decision-making processes. Indeed, one of the key steps in multi-criteria decision-making (MCDM) problems is the structuring and evaluation of decisions, often requiring methods such as AHP. This paper reports on the experience of using an AI-AHP approach for this purpose.

## 2. Literature Review

There were two key research studies: Svoboda & Lande (2024) highlights how large language models (LLMs) like GPT-4 can streamline the decision-making process by acting as virtual experts, improving efficiency and reliability in multicriteria decision analysis. Another study discusses how AI can enhance MCDM through its integration with tools like AHP for better accuracy, scalability, and adaptability (Alves et al., 2023).

## 3. Objectives

The objectives of this study were to explore the overall experience of using an AI-AHP approach and to propose a preliminary decision-making model for the case study.

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## 4. Research Design/Methodology

The methodology involved using the traditional approach: literature review, interviews and surveys; while ChatGPT was used to explore modifications to the decision model. The guidelines for this study were based on the framework for the use of AI tools in research, in use at the University of Zagreb Faculty of Organization and Informatics.

## 5. Results/Model Analysis

The results can be categorized as follows: **a) Advantages of Using ChatGPT**: *Efficiency* was one of the main advantages, as the tool reduced the time needed to generate criteria, evaluate alternatives, and conduct consistency checks, compared to manual processes. Additionally, ChatGPT enhanced *creativity* by providing a variety of perspectives, which contributed to a wider range of ideas and solutions. The *ease of use* was another important benefit, as interacting with the tool was simple and straightforward, allowing for quick and effective results. **b) Disadvantages of Using ChatGPT**: There were some limitations. One issue was the *accuracy of information*; while responses were fast, ChatGPT sometimes produced inaccurate or imprecise data. The *ethics of use* also posed challenges, as ensuring compliance with the FOI ethics framework added complexity to the documentation and methodology. Additionally, AI tools like ChatGPT were *more effective with general topic*s and less so with highly specialized subjects. Lastly, the *difficulty of formulating the right prompts* to get relevant responses was another challenge. **c) Reflections on Research**: Using AI tools improved the research process overall; however, this experience underscored the importance of maintaining a critical approach and highlighted the need for further validation of the results generated by AI to ensure their accuracy and relevance.

## 6. Conclusions

This experience shows that using ChatGPT is effective for quickly structuring problems. However, ChatGPT is most useful when combined with traditional methods. Its benefits include saving time and reducing logistical challenges, while its limitations involve generating generic responses that require further refinement. A suggested approach is to combine methods: using ChatGPT as an initial step to outline the basic structure of the problem and traditional methods to adapt it to the specific needs of the industry. This experience highlights how AI can enhance research processes, while the responsibility for verifying the accuracy and relevance of the data remains with the researcher.

## 7. Limitations

The present study is limited to a single case study which limits the generalization of the findings although opens possible research avenues.

## 8. Key References

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Svoboda, I., & Lande, D. (2024). *Enhancing Multi-Criteria Decision Analysis with AI: Integrating Analytic Hierarchy Process and GPT-4 for Automated Decision Support* (arXiv:2402.07404). arXiv. https://doi.org/10.48550/arXiv.2402.07404