Chapter 9
Natural Language Processing (NLP) for Sustainable Public Administration

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ABSTRACT

Technology with Artificial intelligence (AI) continues to evolve daily and transform public administrations. This study focuses on natural language processing (NLP), one of the effective AI technologies. Sustainability will be addressed within the context of sustainable public administration which is the long-term impact and sustainability of public services. This study suggests that NLP is a vital tool for reform and enhancement in public administration, proposing assumptions on its potential to improve the efficiency, transparency, and inclusiveness of public administration. It explains the usage areas of NLP in public administration with application examples. Thus, three main sustainability issues are examined: environmental, economic and social. In addition, critical challenges of NLP such as language diversity, data privacy and ethical issues are addressed, and solutions are sought. This study aims to present the significant potential of NLP in promoting sustainability in public administration. It creates an important roadmap for researchers, policy makers and practitioners.

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1. INTRODUCTION

The rapid development of technology has transformative effects in the field of public administration, as in every field. Public administration needs speed, innovations and infrastructure in terms of both providing public services and making the right decisions for the public good. Actually, the most important technological development that can meet these needs today is artificial intelligence (AI). The transformative effect of AI on public administration is incontrovertible, especially in terms of sustainability, which is one of the main points of this study. Natural Language Processing (NLP), one of the AI technologies, is a technology that can contribute to the sustainability of public administration as a transformative technology capable of understanding, interpreting and producing human language. These features of NLP are cut out for sustainable public administration.

Sustainable public administration refers to the understanding of considering the long-term effects of public services and policies. This means providing public services and public benefits in a short span of time, with the most effective solutions and in a renewable way. In this context, three main areas of sustainability in public administration stand out: environmental sustainability, economic sustainability and social sustainability. The application of sustainability in public administration requires the formulation, implementation and monitoring of relevant policies. NLP gains significance during this phase since it can help relatively much thanks to its advanced data processing ability.

NLP is composed of the unification of computer science, AI, and linguistics. NLP is aimed to provide computers with the ability to understand and respond to human language. Thus, computers are enabled to process text or audio input in a meaningful and useful way. NLP is composed of three main technologies which are morphological analysis, syntactic analysis and semantic analysis.

Morphological analysis examines the structure of words and their formation rules. Syntactic analysis analyzes sequences of symbols in natural language according to grammatical rules. Semantic analysis examines the meaning of words and how they come together to compose meaningful sentences. In public administration, NLP has quite different application areas. For example, in environmental management, NLP can supervise pollution levels, forecast environmental disasters, and optimize resource usage by analyzing large data sets thanks to the sensors and social media. In economic sustainability, it accelerates administrative processes, diminishes costs, and develops services. On the other hand, it increases governance inclusiveness by dissolving language problems, increasing transparency, and encouraging public participation in social fields.