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Human-Technology Interaction in the Business Environment – A Case of an AI-Driven Addressable TV Platform for Real-Time Programmatic Advertising and Dynamic Ad Insertion

Abstract

The study focuses on assessing human-technology collaboration, such as human-as-strategist and AI-as-optimiser, and describes how, through the implementation of an R&D platform, the role of the TV advertising specialist has evolved from a task executor to a strategic AI partner. For example, humans set the vision and goals, while AI executes and optimises in real time. An AI-driven Addressable TV platform—integrating real-time programmatic advertising and dynamic ad insertion—fundamentally changes how companies manage their brand image in contemporary media ecosystems and significantly reshapes the advertising market. By shifting television advertising from a broad, one-to-many broadcast model to a precise, one-to-one digital interaction, this approach redefines the relationship between viewers and advertising technologies. Such personalized advertising experiences, shaped by continuous human–technology interaction, generate new opportunities for relevance and engagement while also introducing complex risks related to user perception, autonomy, and trust, all of which directly affect brand reputation.

This study presents the design, implementation, and validation of the TeO platform—an innovative, multi-module system enabling automated, programmatic sale and delivery of television advertising based on Addressable TV (ATV) technologies. The platform delivers individualised ads through real-time behavioural profiling of household viewers combined

with dynamic ad insertion (DAI). Central to its operation is the interaction loop between human behavioral signals and AI-driven decision mechanisms: viewer actions inform machine-learning models, which in turn shape the advertising content users receive.

Within the fourth stage of an R&D project funded by the Polish National Centre for Research and Development (NCBiR), the TeO prototype was fully integrated and tested. The platform incorporates artificial-intelligence algorithms, behavioral data processing pipelines, and real-time auction mechanisms to optimize inventory sales while maintaining responsiveness to human factors in media consumption. Results confirm the technical and functional readiness of the TeO system to support large-scale, data-driven advertising operations across broadcast and OTT environments, demonstrating that human–technology interaction is a key determinant of advertising effectiveness and brand communication strategies.