

# How Can Intelligent Persona Features Support Online Advertising Work?

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**Abstract—** The concept of “Intelligent Personas” or “AI personas” presented here builds on extant research on data-driven personas and interactive persona systems. With this conceptualization, we particularly focus on outlining a vision for an intelligent end-to-end advertising system that supports human marketers’ decision making by deploying data-driven personas throughout the stages of the online advertising process. We start by defining the relevant concepts, continue by discussing intelligent personas for online advertising, and conclude by proposing research directions that need to be addressed in order to realize the value of personas in such a system, as well as discussing its potential value for the digital marketing profession.

**Keywords-** *Personas; online advertising; optimization*

## I. INTRODUCTION

*Personas* are fictitious people representing real customer groups, i.e., different types (e.g., most valuable, most loyal, most responsive – or the least valuable, etc.). Most typically, personas are presented to decision makers as *persona profiles*, i.e., narrative representations of different kinds of users belonging to a particular demographic, behavior, and/or attitude involved in using a product, site, or brand [1]. However, personas can also be accessed via *interactive persona systems* that rely on Web technologies and enable searching, filtering, or even generating personas from raw data [2]. Overall, personas act as surrogate mental models when inputs from actual customers are absent or unavailable for decision makers [1] – essentially, personas provide customer-centric inputs when needed, where needed.

The concept *intelligent persona* (IP) can refer to two aspects: (a) the intelligent features of an interactive persona system, or (b) persona generated through artificial intelligence (AI) technology (this is also called *AI personas* by some authors [3], while yet others refer to *algorithmically-generated personas* [4] or *data-driven personas* [5]). Finally, *persona analytics* refers to either

understanding customer or users via systems that combine analytics and personas, or the goal of understanding how stakeholders interact with persona profiles and systems [6].

Overall, the concept of IP builds on extant research on data-driven personas, interactive persona systems, and intelligent system features that leverage state-of-the-art human-computer interaction (HCI) techniques and support marketing functions via the employment of personas [2]. More broadly, the IP concept can aid in outlining a vision for an intelligent end-to-end advertising system that supports human marketers’ decision making by deploying data-driven personas throughout the stages of the modern online advertising process. What we mean by this is that the work of online advertisers consists of various tasks, and those tasks can be supported through IP.

In Section 2, we outline a vision for the use of IP in the context of online advertising. In Section 3, we present conclusions and discuss future work on this domain.

## II. VISION FOR INTELLIGENT PERSONAS

The value of IP can be particularly salient in the context of *computational advertising* which refers to the use of technology and data to optimize the targeting and delivery of ads [7] (a closely related concept is *intelligent advertising* which refers to the use of features that mimic human intelligence in the advertising process [7]). Hence, the vision of IP in online advertising can be formalized as [personas + computational advertising + intelligent features = ?]. In other words, a scrutiny that considers multiple perspectives: the benefits of personas as empathy-friendly mental modeling instruments, the contributions of computational advertising in terms of algorithms, and user interface (UI) and user experience (UX) aspects brought about by intelligent systems research. If in the equation these are on the numerator side, then *advertiser work tasks* are on the denominator side, resulting in the following formulation: [(personas + computational advertising + intelligent features) / advertiser work tasks = ?]. In other words, we need to

consider the benefits or possibilities provided by technology HCI in regard to user needs which are reflected in the daily work tasks among advertisers.

What does advertisers’ work consist of, then? There are a few prime elements which we discuss. First, we consider *segmentation*. This refers to dividing the total available market into addressable constituents, i.e., segments. Here, we observe that persona is a segment with a name and a face. Hence, segmentation can be done in a persona-assisted manner, yielding personas as outcomes. Once segmentation is done, *targeting* follows; namely, advertisers select which segments to focus on. Here, an IP system can recommend specific personas to target, given an explicit goal such as maximize reach, engagement, or sales. After targets are chosen, *ad copywriting* follows. Here, IP can be of use by generating ad headlines, texts, and even imagery personalized to the selected personas. After ad content has been created, advertisers proceed to *campaign set-up*. This means creating the campaigns in the ad platform and configuring the settings. Here, IP can provide a structure; i.e., campaigns can be organized by personas, ensuring that the naming and targeting criteria match the personas [8]. This then yields an advantage in the next stage which is *optimization*; i.e., making decisions based on the results. Namely, once campaigns are running, they start to generate data; if the data is organized by personas, it becomes easier for an algorithm (or a human) to adjust budget allocation given the actual marketing performance of a given persona.

As decision making in online advertising work practice ranges from insights formation to targeting, campaign and ad creation, reporting, and optimization, for each stage, we envision intelligent persona features that support the core tasks associated with the stage. To illustrate, Figure 1a presents AI-generated personas with ad text and image boxes for each persona (highlighted in red) for ad text creation and image selection for a human marketer. In contrast, Figure 1b shows a view where “Tyler” has been expanded for a more detailed view with ad text columns for multiple advertising channels for easier ad creation.

### III. CONCLUSION

We have outlined some examples of how IP can be deployed in online advertising. By using algorithms, machine learning, and AI, marketers can create more personalized ad campaigns and more accurately measure the impact of their efforts. This paradigm shift can increase transparency, efficiency, and effectiveness within the industry. While computational advertising is transforming traditional advertising to become more cost-effective and efficient, while allowing marketers to better understand and reach their target audience, personas can accelerate this positive transformation. Nevertheless, much work is needed to capture IP’s potential value for the advertising profession, toward the realization of a visionary framework that leverages intelligent personas for more efficient and effective management of online advertising campaigns by human marketers. There is also a need to investigate the dynamics of machines replacing marketing work, and the sharing of

labor in situations where intelligent features collaborate with humans towards more optimal advertising performance.



Figure 1. Concept example of intelligent persona features.

### REFERENCES

- [1] A. Cooper, *The Inmates Are Running the Asylum: Why High Tech Products Drive Us Crazy and How to Restore the Sanity*, 1st ed. Indianapolis, IN: Sams - Pearson Education, 1999.
- [2] S.-G. Jung, J. Salminen, and B. J. Jansen, “Giving Faces to Data: Creating Data-Driven Personas from Personified Big Data,” in *Proceedings of the 25th International Conference on Intelligent User Interfaces Companion*, in IUI '20. Cagliari, Italy: Association for Computing Machinery, Mar. 2020, pp. 132–133. doi: 10.1145/3379336.3381465.
- [3] A. Holzinger, M. Kargl, B. Kipperer, P. Regitnig, M. Plass, and H. Müller, “Personas for Artificial Intelligence (AI) an Open Source Toolbox,” *IEEE Access*, vol. 10, pp. 23732–23747, 2022, doi: 10.1109/ACCESS.2022.3154776.
- [4] J. Salminen, S.-G. Jung, and B. Jansen, “Intentionally Biasing User Representation?: Investigating the Pros and Cons of Removing Toxic Quotes from Social Media Personas,” in *Nordic Human-Computer Interaction Conference*, 2022, pp. 1–13. doi: https://doi.org/10.1145/3546155.3546647.
- [5] J. J. McGinn and N. Kotamraju, “Data-driven persona development,” in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Florence, Italy: ACM, 2008, pp. 1521–1524. doi: 10.1145/1357054.1357292.
- [6] J. Salminen, S.-G. Jung, and B. Jansen, “Developing Persona Analytics Towards Persona Science,” in *27th International Conference on*

*Intelligent User Interfaces*, in IUI '22. New York, NY, USA: Association for Computing Machinery, Mar. 2022, pp. 323–344. doi: 10.1145/3490099.3511144.

[7] Y. Yang, Y. C. Yang, B. J. Jansen, and M. Lalmas, “Computational Advertising: A Paradigm Shift for Advertising and Marketing?,” *IEEE Intell. Syst.*, vol. 32, no. 3, pp. 3–6, May 2017, doi: 10.1109/MIS.2017.58.

[8] J. Salminen, I. Kaate, A. M. S. Kamel, S. Jung, and B. J. Jansen, “How Does Personification Impact Ad Performance and Empathy? An Experiment with Online Advertising,” *International Journal of Human-Computer Interaction*, vol. 0, no. 0, pp. 1–15, Aug. 2020, doi: 10.1080/10447318.2020.1809246.