Designing Intelligent Characters Representing Organisations in Digital Worlds

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Abstract

Advances in technology have led to the creation of virtual worlds where people can interact with intelligent characters representing organizations. As these interactions increase, it's crucial to understand digital character design and its societal and business implications. This research aims to investigate the design elements of digital characters and provide prescriptive knowledge for organizations. Using the design science research paradigm, we'll answer the question of how to design digital characters that best represent a company. We draw on theories from human-computer interaction, marketing and brand design, corporate communications, and character design from industries such as game design and screenwriting.

Keywords

Conversational agents, metaverse, character, design, avatars

Introduction

Organizations and society at large are moving deeper into the digital world, with major tech companies like Meta launching the Metaverse, proving once again that ordinary lives are becoming more digital (Park and Kim 2022). The evolution of technologies such as augmented reality or virtual reality and recent advances in artificial intelligence leads not only to the implementation of virtual worlds where people meet each other and interact but also to the use of intelligent characters as artificial interaction partners (Dwivedi et al. 2022; Park and Kim 2022). The potential effects of digital worlds, such as the metaverse on society and its people are a highly discussed topic in research (Dwivedi et al. 2022; Kim 2021), as the way users spend their leisure activities in digital worlds and how companies get in touch with potential customers will change (Davis et al. 2009; Dwivedi et al. 2022; Kim 2021). For example, Dwivedi et al. (2022) discuss how the metaverse will shape the future of consumer research, e.g. how companies will transfer their branding to the metaverse, what advertising and consumer psychology will look like in the metaverse, or how digital characters representing companies in digital worlds can be designed.

Against this backdrop, digital characters are becoming increasingly common, and interactions between them and humans more frequent and nuanced (Ahmad et al. 2022; Diederich et al. 2022; Nißen et al. 2021). The more frequent these interactions become, the more important it gets to thoroughly understand the characters' design processes and the related societal and business implications (Elshan et al. 2022; Nißen et al. 2021; Siemon 2022). Oftentimes digital characters have personalities that are consciously designed (Ahmad et al. 2022; Robert et al. 2020). Even if the character's interface is voice or text only, the personality will come across through the interfaces' communication (behavior and speech - tone, rhythm, choice of words, diction, etc.) (Ahmad et al. 2022). If the design process is thorough, various elements that constitute personality are carefully crafted and thus make an impression of a consistent personality for those interacting with the character (Ahmad et al. 2022; Feine et al. 2019; Robert et al. 2020). Experts, such as Mariana Lin, the head writer of Apple's Siri, argues that each digital character has a personality,

even if it is not consciously designed. In those cases, the personality just comes together randomly without proper design and control of the outcome (Lin 2018).

Therefore, it is important to research digital characters representing organizations and companies and go beyond mere technical functionality. Although there is a large body of literature regarding the design of digital intelligent systems (Diederich et al. 2022; Elshan et al. 2022; Nißen et al. 2021), such as conversational agents and the impact of individual design elements on users (Ahmad et al. 2022; Feine et al. 2019), to the best of our knowledge, there is no research on how digital characters should be designed to best represent a company or organization in digital worlds. In this multidisciplinary research project, we incorporate diverse theoretical approaches from fields such as human-computer interaction, marketing, brand design, corporate communications, and practical activities like character design from game design and screenwriting industries.

In our research, we explore elements constituting a digital character within an organization's digital presence and develop a framework and participatory design process that organization can use to create characters for digital worlds that represents them. For this, we formulate the following research question:

RQ: How can digital characters be designed to represent organizations and companies in digital worlds?

To address this research question, we employ the design science research paradigm (Hevner et al. 2004) to generate prescriptive knowledge, enabling organizations to systematically and rigorously design digital characters that effectively convey their brand message and represent their company in the digital realm.

Intelligent digital characters representing organizations

Characters, such as mascots, have long been used by organizations to represent their brand (Cayla 2013; The Mill 2021) and are designed to be memorable, relatable, and reflective of the company's values. They help build brand recognition and foster connections with consumers (Pairoa and Arunrangsiwed 2016). Research indicates that mascots effectively increase brand awareness, recall, and customer loyalty while positively influencing consumer behavior and product attitudes (Cayla 2013; Malik and Guptha 2014; Pairoa and Arunrangsiwed 2016). Mascots can also help to humanize a brand, making it easier for consumers to connect with the company and form an emotional attachment (Radomskaya and Pearce 2021). Another example and growing trend of digital characters used in marketing are virtual influencers.

Advances in artificial intelligence have made digital characters increasingly popular as a form of automated interaction partners (McTear et al. 2016), often referred to as conversational agents. Conversational agents are used in a variety of scenarios to enable (potential) customers to interact with their organization, for example in support or consulting (McTear et al. 2016). Conversational agents are not necessarily designed to be purposeful, consistent, and plausible (Diederich et al. 2022), although they do convey a certain personality through their behavior and appearance (Lin 2018). Drawing from previous studies (Ahmad et al. 2022; Eder 2020), we define character as distinctive mental and moral aspects, like traits, attitudes, and values, influencing a conversational agent's behavior, communication, and appearance. A digital intelligent character is therefore a virtually embodied character with intelligent interactive features based on artificial intelligence giving it the ability to interact in natural language.

Digital characters have several advantages over traditional mascots. For one, they can be more versatile in regard to their design and behavior (Ahmad et al. 2022; Feine et al. 2019), and they can be easily adapted to different contexts, environments, and users. Digital characters can also be used in a wide range of media, including websites, social media, and virtual reality environments (McTear et al. 2016). Although digital characters have recently become more common, designing a technical interface to have human-like characteristics or a strong personality is not new (McTear et al. 2016; Weizenbaum 1966). However, researchers provide frameworks or taxonomies of specific design choices for conversational agents that induce it with, for example, personality (Ahmad et al. 2022; Feine et al. 2019; Robert et al. 2020). Research demonstrates how design choices can give conversational agents personality traits and affect perceived humanness, but the impact of these choices on an organization's brand perception is less understood.

Research design

In order to pursue our design-oriented research and generate prescriptive knowledge, we follow the principles and guidelines of design science research which combine the design of artifacts with scientific rigor and practical relevance (Hevner et al. 2004). The aim of our research is to create a framework with prescriptive knowledge that provides companies with a tangible tool showing which design choices in the creation of intelligent digital characters influence the representational properties of their company. Our framework thus contains prescriptive knowledge with means-end relationships about design choices and their effect on the perception and representational qualities of the company. In addition, it contains concrete information about which process (e.g., co-creation process), which resources, which requirements, and other aspects are necessary in the design of digital intelligent characters in order to achieve the best possible representation of a company. Within our design science research approach, we employ different methods to address our objective, starting with a (1) multi-vocal literature review (Garousi et al. 2019), a co-creation workshop with companies (2), and different experimental studies (3). All steps have the overall aim of creating prescriptive knowledge and are explained in more detail below.

Multivocal systematic literature review

A multivocal literature review is a type of literature review that considers multiple perspectives and voices from various sources, including scientific articles (white literature) as well as whitepapers, blogs, and other non-research sources (grey literature) (Garousi et al. 2019). This approach highlights the need for understanding and integrating diverse viewpoints and biases in research, rather than solely relying on dominant perspectives or traditional scientific literature (Garousi et al. 2019). Multivocal literature reviews are especially valuable in fields with diverse opinions, such as social sciences, humanities (Schöpfel and Farace 2010) and multidisciplinary areas. Ultimately, this more inclusive and comprehensive method offers a nuanced understanding of the studied topic (Garousi et al. 2019; Schöpfel and Farace 2010).

The aim of our multivocal literature review is to find knowledge about the design of intelligent digital characters and specifically to identify deliberate design choices that have been used to fulfill a targeted effect or purpose related to a company (e.g., brand communications, corporate culture, or the like). We follow the steps to conduct a multivocal literature review by Garousi et al. (2019). The data collection involved automated Scopus queries for white literature and Google searches for grey literature. We developed a search string that uses a combination of keywords and operators, following the guidelines of vom Brocke et al. (2015). We used the following search string (title, abstract, and keywords) for white literature:

((conversational AND agent) OR (virtual AND assistant) OR (voice AND assistant OR avatar OR bot OR (interactive AND agent) OR (dialogue AND system) OR (conversational AND AI) OR (smart AND assistant) OR (intelligent AND assistant)) AND ((character AND design) OR (persona AND design) OR (personality AND design))

We limited our search to articles from 2002-2023 in disciplines like computer science, engineering, social sciences, arts, humanities, psychology, decision sciences, business, management, and accounting, as well as multidisciplinary articles, to ensure a focused analysis of contemporary, relevant literature and up-to-date insights reflecting the field's current state. We conducted the search in November 2022 and found a total of 820 articles. We then analyzed them with the help of multi-stage inclusion and exclusion criteria in order to filter only the articles that were relevant to us. In the first step, only articles were included that (1) consist of any form of intelligent digital character(s), (2) with any kind of deliberate design choice for the character(s). In the second step, articles were filtered where the intelligent character is expected to convey a representation or a message through some of the design choices. The gray literature search and analysis will happen in April and May 2023.

Participatory workshops

In the second step, a series of participatory workshops will be conducted together with companies to test an initial version of the framework, to evaluate the integration of the company, and which actors of the company need to be involved. In conducting the workshops, we follow established methods of

participatory action research (Baum et al. 2006) such as action design research (Sein et al. 2011), which fits well into our overall design-oriented research approach. A common process will be developed on how to use the framework and what technologies are needed to create an intelligent digital character. In order to obtain scientifically rigorous results from this process, the workshops will be documented by external researchers and interviews with the involved employees will be conducted to further develop the framework. In addition, the digital intelligent characters created in the workshop will be examined to see if the design choices can achieve their intended effect.

Experimental studies

With the help of the workshop results, the framework will be refined and the participatory process will be used for the design of digital intelligent characters in the sense of DSR, taking into account the relevance for the company (its brand, corporate communications, and other requirements), as well as drawing on scientific rigor, i.e. the knowledge base. In this way, a series of intelligent digital characters with deliberate design choices will be developed, which will then be evaluated in experimental studies. Different versions of intelligent characters will be developed with different design choices in order to measure the effect on potential customers and interaction partners of the company. The effect and the perceived characteristics of the company to be represented will then be tested in various experimental settings following established guidelines for experimental research (Dennis and Valacich 2001; Fink 2022). In this way, both the framework as a whole can be evaluated and individual design choices and their means-end relationship can be checked.

Initial results and outlook

In the research project's initial phase, findings from the multivocal literature review indicate that studying digital characters is a multidisciplinary endeavor involving fields like marketing, human-computer interaction, psychology, and information systems. Knowledge is dispersed across these areas, with numerous terminologies and definitions used inconsistently. Researchers often define "character" or "personality" differently, not specifically referring to traits but discussing personality in broader terms. Furthermore, there is a substantial increase in articles within the last years, with 78 papers published in 2022 and 79 papers published in 2021, while for example in 2012 only 38 papers were published. This increase started in 2016, most probably due to the advances in artificial intelligence and its impact on the design and development of conversational agents (McTear et al. 2016). Preliminary findings reveal that computer science's focus on digital character development relates primarily to computer game characters, which we excluded from our analysis since they don't represent organizations. Instead, we differentiate between computer games and digital worlds like the metaverse, where gaming elements blend with company interactions and customer engagement, such as purchasing goods.

Our initial findings carry implications for our primary research objective: establishing a framework that encompasses prescriptive knowledge on digital character design choices and their influence on organizational representation and perception. The array of research disciplines involved implies that our proposed participatory design process should adopt a multidisciplinary approach, engaging employees from diverse corporate roles. Subsequent steps involve applying inclusion criteria to scrutinize pertinent articles and exploring grey literature to derive insights into character design within artistic disciplines (notably film and television) and the impact of mascots and deliberate design decisions.

REFERENCES

Ahmad, R., Siemon, D., Gnewuch, U., and Robra-Bissantz, S. 2022. *A Framework of Personality Cues for Conversational Agents*, presented at the Hawaii International Conference on System Sciences.

Baum, F., MacDougall, C., and Smith, D. 2006. "Participatory Action Research," *Journal of Epidemiology and Community Health* (60:10), BMJ Publishing Group, p. 854.

vom Brocke, J., Simons, A., Riemer, K., Niehaves, B., Plattfaut, R., and Cleven, A. 2015. "Standing on the Shoulders of Giants: Challenges and Recommendations of Literature Search in Information Systems Research," *Communications of the Association for Information Systems* (37:1), p. 9.

Cayla, J. 2013. "Brand Mascots as Organisational Totems," *Journal of Marketing Management* (29:1–2), Routledge, pp. 86–104.

Davis, A., Murphy, J., Owens, D., Khazanchi, D., and Zigurs, I. 2009. "Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses," *Journal of the Association for Information Systems* (10:2).

Dennis, A. R., and Valacich, J. S. 2001. "Conducting Experimental Research in Information Systems," *Communications of the Association for Information Systems* (7:1).

Diederich, S., Brendel, A., Morana, S., and Kolbe, L. 2022. "On the Design of and Interaction with Conversational Agents: An Organizing and Assessing Review of Human-Computer Interaction Research," *Journal of the Association for Information Systems* (23:1), pp. 96–138.

Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J. (Grace), Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A. S., Lartey, J. O., Pandey, N., Ribeiro-Navarrete, S., Raman, R., Rauschnabel, P. A., Sharma, A., Sigala, M., Veloutsou, C., and Wirtz, J. 2022. "Metaverse Marketing: How the Metaverse Will Shape the Future of Consumer Research and Practice," *Psychology & Marketing*.

Eder, J. 2020. *Die Figur Im Film: Grundlagen Der Figurenanalyse*, Schüren Verlag.

Elshan, E., Zierau, N., Engel, C., Janson, A., and Leimeister, J. M. 2022. "Understanding the Design Elements Affecting User Acceptance of Intelligent Agents: Past, Present and Future," *Information Systems Frontiers*.

Feine, J., Gnewuch, U., Morana, S., and Maedche, A. 2019. "A Taxonomy of Social Cues for Conversational Agents," *International Journal of Human-Computer Studies* (132), pp. 138–161.

Fink, L. 2022. "Why and How Online Experiments Can Benefit Information Systems Research," *Journal of the Association for Information Systems* (23:6), pp. 1333–1346.

Garousi, V., Felderer, M., and Mäntylä, M. V. 2019. "Guidelines for Including Grey Literature and Conducting Multivocal Literature Reviews in Software Engineering," *Information and Software Technology* (106), pp. 101–121. (https://doi.org/10.1016/j.infsof.2018.09.006).

Hevner, A. R., March, S. T., Park, J., and Ram, S. 2004. "Design Science in Information Systems Research," *MIS Q.* (28:1), pp. 75–105.

Kim, J. 2021. "Advertising in the Metaverse: Research Agenda," *Journal of Interactive Advertising* (21:3), Routledge, pp. 141–144.

Lin, M. 2018. "How to Write Personalities for the AI Around Us," *The Paris Review*. (https://www.theparisreview.org/blog/2018/05/02/how-to-write-personalities-for-the-ai-around-us/).

Malik, G., and Guptha, A. 2014. "Impact of Celebrity Endorsements and Brand Mascots on Consumer Buying Behavior," *Journal of Global Marketing* (27:2), Taylor & Francis, pp. 128–143.

McTear, M., Callejas, Z., and Griol, D. 2016. "The Conversational Interface," *Springer* (6:94), p. 102.

Nißen, M. K., Selimi, D., Janssen, A., Cardona, D. R., Breitner, M. H., Kowatsch, T., and von Wangenheim, F. 2021. "See You Soon Again, Chatbot? A Design Taxonomy to Characterize User-Chatbot Relationships with Different Time Horizons," *Computers in Human Behavior*, p. 107043.

Pairoa, I., and Arunrangsiwed, P. 2016. "The Effect of Brand Mascots on Consumers' Purchasing Behaviors," *International Journal of Economics and Management Engineering* (10:5), pp. 1702–1705.

Park, S.-M., and Kim, Y.-G. 2022. "A Metaverse: Taxonomy, Components, Applications, and Open Challenges," *IEEE Access* (10), IEEE, pp. 4209–4251.

Radomskaya, V., and Pearce, P. L. 2021. "Adding Character: The Role of Destination Mascots in Tourism Development," *Tourism Management* (84), p. 104248.

Robert, L., Alahmad, R., Esterwood, C., Kim, S., You, S., and Zhang, Q. 2020. "A Review of Personality in Human–Robot Interactions," *Available at SSRN 3528496*.

Schöpfel, J., and Farace, D. J. 2010. "Grey Literature," *Encyclopedia of Library and Information Sciences,* pp. 2029–2039.

Sein, M., Henfridsson, O., Purao, S., Rossi, M., and Lindgren, R. 2011. *Action Design Research*.

Siemon, D. 2022. "Let the Computer Evaluate Your Idea: Evaluation Apprehension in Human-Computer Collaboration," *Behaviour & Information Technology*, Taylor & Francis.

The Mill. 2021. *Brand Characters and Mascots - A White Paper*, The Mill.

Weizenbaum, J. 1966. "ELIZA—a Computer Program for the Study of Natural Language Communication between Man and Machine," *Communications of the ACM* (9:1), ACM New York, NY, USA, pp. 36–45.