Features of Persuasive AI in the Workplace

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Abstract. Artificial Intelligence (AI) technologies can act as persuaders when implemented in workplace tools and infrastructure. How users process and react to interacting with features of such AI technologies in the workplace remains ill-understood. Literature in human-AI interaction suggests that cues in the user interface can dictate how users process information communicated by an AI and how receptive they are to being persuaded to change or reinforce their behaviors. Literature from human-AI interaction and an existing systematic framework of the study and design of persuasive technology from human-computer interaction can be applied to examining how users interact with persuasive AI in workplace tools and infrastructure. This paper aims to illustrate the application of such a systematic framework for persuasive technology to the study of persuasive AI technologies in the workplace context. Adapted from the persuasive technology framework, an illustrative vignette of a widely used workplace AI-powered tool is offered to further demonstrate features and principles of systems that include a persuasive AI component.

Keywords: human-AI interaction · persuasive technology · AI-powered workplace

1 Introduction

Organizations have increasingly adopted artificial Intelligence (AI) tools in the workplace. Results from a survey by McKinsey conducted in 2020 indicated that the adoption of AI powered tools in the workplace generates significant value for organizations, which may justify their rapid and wide adoption [1]. AI technologies can also act as persuaders in their interactions with users of AI-powered workplace tools and infrastructure. Through persuasion, AI may support employees successfully fulfilling their role within the organization. For example, an AI-powered enterprise social media system may offer behavioral feedback to employees through a dashboard that improves their productivity habits in meetings. This can further enhance the value that AI-powered workplace tools bring to an organization. The user experience of persuasive AI-powered workplace tools has lacked attention in research [2]. As a result, how users process and react to interacting with features of persuasive AI-powered workplace tools has remained ill-understood.

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Literature in human-AI interaction has explained users' cognitive processing of interactions with AI in a generalized context. In their interactions with AI technologies certain aspects of the user interface may trigger cues that can dictate the ways users may be receptive to information an AI communicates [3]. Cues can be influenced by positive or negative stereotypes users have of AI, thereby also guiding how users cognitively process communication they receive from an AI technology [4]. Literature in human-computer interaction has proffered guidance for designing and studying technologies that aim to be persuasive [5–8]. Such literature includes a systematic framework that details features, principles, and assumptions for persuasive technology [8]. The goal of this paper is to piece together the workplace context of AI-powered tools and infrastructure with literature in human-AI interaction and the systematic framework for persuasive technology proposed in human-computer interaction. With this approach, this paper offers an overview of features and characteristics of persuasive AI in the workplace. What follows is an outline of literature discussing persuasion and persuasive technology, followed by an understanding of AI and its persuasive capabilities found in the intersection between social psychology, human-computer interaction, and human-AI interaction. Finally, through a vignette using Microsoft's Viva Insights system, the application of the persuasive technology systematic framework to identify examples of features and principles of systems that include a persuasive AI component is demonstrated, followed by a discussion on this application.

2 Background

2.1 Overview of Persuasion and Persuasive Technology

Persuasion can generally be defined as an attempt to influence another person's attitude or behavior, without the use of coercion or deception [9]. According to definitions found in literature, the process of persuasion must be a successful attempt at influencing, where persuading is done intentionally, volitional action is available to the persuadee, and a change in attitude or behavior is the result of the interaction [9]. Technologies that are designed to influence users' attitudes or behaviors are referred to as 'Persuasive Technology', which extends persuasion as it is known in social psychology to human-computer interaction. The study and design of such technologies originated as 'Captology' (Computers as Persuasive Technology) and is defined as "the study of computers as persuasive technologies" where a persuasive computer refers to "an interactive technology that changes a person's attitudes or behaviors" [10]. The study of persuasive computers (or technology overall) has been developed to a systematic framework, that can be applied in the study or design of persuasive technology [8]. The framework defines persuasive technology (PT) as "computerized software or information systems designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception" [8].

A Framework for Persuasive Technology Study and Design. To guide researchers and practitioners through the study or design of PT, the authors of the systematic framework provide a mapping of categories of features to system principles based on assumptions about the role of users in the persuasion process, persuasion strategies technologies employ, and assumed features of persuasion in technology (see Table 1) [8].

Table 1. PT system features overview, summarized and adapted from Oinas-Kukkonen & Harjumaa, 2008

System Feature	Definition	Principle
Primary Task Support	System provides content that enables and assists user to carry out their primary tasks	Reduction, tunneling, tailoring, personalization, self-monitoring, simulation, and rehearsal
Dialogue Support	System features human-computer dialogue that supports users in progressing to target behaviors	Praise, rewards, reminders, suggestions, similarity, liking, and social role
System Credibility Support	System leverages credibility to be more persuasive	Trustworthiness, expertise, surface credibility, real-world feel, authority, third-party endorsements, and verifiability
Social Support	System uses social influence strategies	Social learning, social comparison, normative influence, social facilitation, cooperation, competition, and recognition

2.2 Persuasive AI Technology

Research on how an AI technology may persuade its users is in its infancy. Persuasive AI technology can be described as a persuasive technology that includes an AI component. AI may act as a persuader and facilitate a persuasive user experience due to its distinct characteristics. [5] describe 'persuasion profiles' in systems that adapt to user differences. Persuasion profiles are defined as: "collections of expected effects of different influence strategies for a specific individual" [5]. The capability to create such profiles involves the triangulation of user activity data and persuasion histories to develop an influence strategy that is tailored to an individual user, essentially personalizing the experience of persuasion. The result is the adaptive system possesses the intelligence of how to persuade, with what information, and when. The computational power AI technologies to facilitate the creation and maintenance of 'persuasion profiles' is another distinct characteristic of persuasive AI.

Cues involved in the human-to-human persuasion process potentially have different effects. Literature in human-AI interaction has explored the significance of cues in how users process information communicated by an AI technology. It is suggested that users may use a *machine heuristic*, where negative or positive stereotypes of AI guide their judgements about their interactions with AI technologies [4]. Additional research in the human-AI interaction literature has discussed how AI may *complicate* persuasion. Due to cues in the user interface, users may be triggered to process information differently based on whether there is obvious involvement of an AI, or if there is ambiguity about

whether the user is interacting with AI or a human. These indicators may complicate persuasion as users may be receptive to a human or an AI source in different ways, thereby altering the persuasion process and outcomes.

Such processes also raise questions about how users may respond differently to communication of the same information by an AI versus a human: would employees be receptive to feedback communicated by their manager in the same way an AI would communicate feedback? While such a question requires empirical study, existing research has demonstrated there is a difference in how humans treat other humans versus AI. At a conceptual level, the Computers Are Social Actors paradigm has conceptualized such a difference indicating that humans adapt scripts to interacting with AI and technology in general, that deviates from scripts they use to interact with humans [11, 12]. Such research makes a case for not only the importance of cues in a user interface for how users may be receptive and process persuasion from an AI, but also the favorability for employing AI-powered tools and infrastructure in the workplace to enhance employee success.

Distinct differences exist that allow an AI to effectively persuade in the digital space. Oinas-Kukkonen and Harjumaa indicate one of the assumptions of persuasive technology is that it is 'never neutral', meaning it is persuading its users constantly in various ways [8]. To arrive to a strategy for how to influence a user, technology must be 'always' listening and observing – that is, while the user interacts with the technology regardless of engaging in the behavior that is intended to be influenced. AI systems may use this active learning to process data collected and compute the appropriate influence strategies [5]. The use of digital tools in a workplace environment is necessary for employees to participate and contribute effectively to their role. This means an AI technology has a constant stream of data and feedback to learn from, as well as ample opportunity to interact with users - in terms of time and digital spaces.

3 Workplace Tools and Persuasive AI Technology Design: Microsoft Viva Insights

Viva is an AI powered persuasive workplace behavior feedback tool provided by Microsoft. Viva connects to the Microsoft ecosystem of workplace tools and infrastructure and generates insights that are valuable to multiple members in an organization. Microsoft defines Viva as an "employee experience platform within Microsoft 365 and Microsoft Teams that brings together communications, knowledge, learning, resources, and insights into the flow of work" [13]. Viva includes multiple applications that Microsoft categorizes into "Connection", "Insight", "Purpose", "Growth", and "Role-based experiences" [13].

The "Insight" category is of particular interest for illustrating how an AI tool in the workplace may persuade users. Similarly to aforementioned 'persuasion profiles' [5], Viva Insight is based on triangulated data from "workplace activities, communication behaviors and collaboration patterns" that help to empower employees in manager or leadership roles to improve business outcomes, and at the same time for employees in any role to achieve personal well-being, effectiveness, and collaboration goals. With such features, Viva Insight can provide a revealing vignette for how a persuasive AI tool that

provides behavioral feedback encompasses the system features and system principles put forth by [8] in their framework for the study and design of persuasive technology (See Table 1 for overview). With example screen-captures from the Microsoft Viva website, the implementation of these system features and principles is outlined.

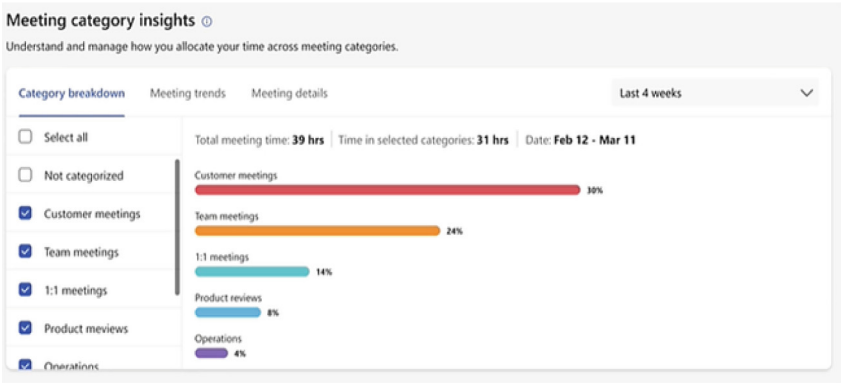

Fig. 1. Microsoft Viva; Primary Task Support

3.1 Primary Task Support

Primary Task Support in Oinas-Kukkonen and Harjumaa's framework indicates the system must provide "meaningful content for the user" to assist users in carrying out their primary tasks [8]. Observing features included in the "Productivity" and "Wellbeing" tabs in Viva Insights, primary task support for principles such as, for example, Personalization where "personalized content and services for its users" are provided, or Self-monitoring opportunities where "means for users to track their performance or status" are offered by the system [8]. Figures 1 and 2 provide example screenshots of how Primary Task Support is included in this AI-powered persuasive system. The system reduces the steps that users must follow to perform target behaviors, and tunnels users through the process of changing their behavior in ways that are aligned with their Primary tasks (i.e., main objectives) by providing suggestions based on insights (see Fig. 2). Furthermore, the system tailors the information that users are exposed to, personalizes the content and services they are shown, and simulates the target behaviors by displaying links between the antecedents and outcomes of these desired behaviors (see Fig. 1).

3.2 Dialogue Support

According to the Persuasive Technology systematic framework, dialogue support in a persuasive system should assist users to "keep moving towards their goal or target behavior" where computer-human dialogue is implemented [8]. Viva Insights includes multiple human-computer dialogue support principles, as outlined in the framework for persuasive systems. The system praises its users with feedback in the form of "words,

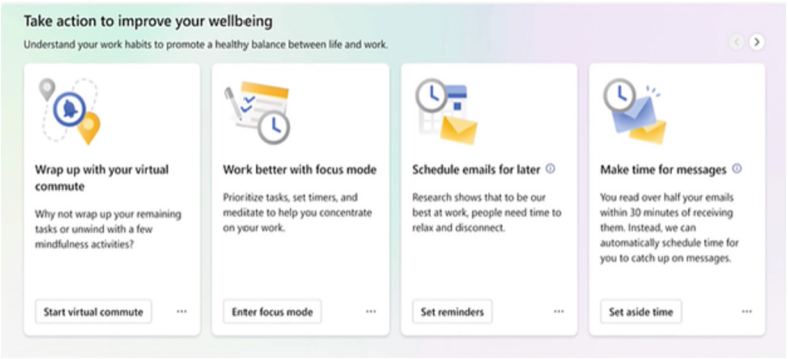

Fig. 2. Microsoft Viva; Primary Task Support and Dialogue Support

images, symbols, or sounds" that are positive (see Fig. 1). The system also reminds users of their objectives with tracking of progress they make towards them and suggestions of behaviors they may want to perform to support their objectives (See Fig. 2). Such system principles are manifested in Microsoft Viva with the assistance of AI powered behavior feedback that aims to persuade users to alter their behaviors or attitudes.

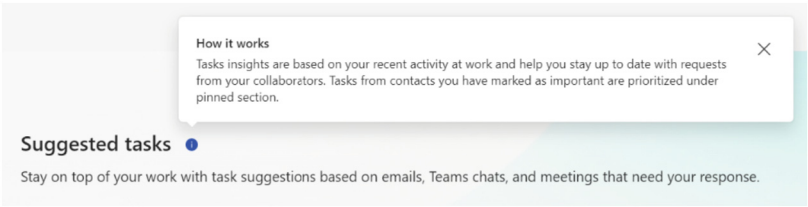

Fig. 3. Microsoft Viva; System Credibility Support

3.3 System Credibility Support

System credibility support features entail the design of a system that is "more credible and thus more persuasive" [8]. Viva Insights include multiple such features through the system principles implemented, as detailed in the PT framework [8]. Viva Insights provides credibility information with the personalized insights that are accompanied by suggestions (see Fig. 3). Additionally, Viva Insights contains surface credibility with the clear indication of a "competent look and feel" [8], featuring analytics visualizations that effectively communicate insights and feedback.

3.4 Social Support

Viva Insights also makes use of social influence strategies, adapted to system principles [8]. By providing users with the chance to offer "praise" to co-workers, connect with

members of the organization that may have beneficial outcomes, and data analytics on existing collaborations, Viva Insights includes Social Support features. For example, users can continue to achieve their target behavior by cooperation via the collaboration tab analytics in Viva Insights. Viva Insights also inherently provides social learning opportunities, since they indicate to users that their suggestions are generated based on a triangulation of various data points fed by their interaction with the technology.

4 Discussion

Literature explored in previous sections has illuminated how an AI-powered technology tool can achieve persuasive qualities. Applying this to the workplace, features of persuasive AI can be identified. By employing the systematic framework developed by Oinas-Kukkonen and Harjumma, the way that persuasive AI in a workplace tool such as Microsoft Viva Insights was explained. Microsoft Viva Insights persuasive AI influences its users to change or progress towards target behaviors. The vignette identifies how each of the four system features found in [8] framework for persuasive technology exist in the system, and how some of their principles are implemented. Primary task support is implemented with various system principles present, such as reduction, tunneling, tailoring, personalization, and self-monitoring. Dialogue support can be found by system principles present that indicated praising, reminders, and suggestion. System credibility support presents with expertise and surface credibility system principles, while social support is displayed through cooperation and social learning. Figures 1, 2 and 3 provided screen captures to depict how each of these feature categories appear in Microsoft Viva Insights user interface.

Cues in the user interface of a workplace tool that features an AI component can help facilitate users processing of information appropriately. Users can be receptive to persuasion from an AI source in a way that is different from a human source. Perception that an AI has credibility help to create receptivity to persuasive attempts. For example, if an AI-powered tool such as Microsoft Viva recommends the user schedules more time between their meetings to improve their productivity and attentiveness when attending meetings may be processed with acceptance and willingness to perform the behavior due to the 'obvious' nature of the AI component in the Microsoft Viva user interface. Stereotypes may influence how cues are processed [4] and have potential to result in the successful persuasion of users by an AI.

The applicability of the systematic framework for persuasive technology to persuasive AI is apparent, yet research on how the process of persuasion occurs using these features remains to be demonstrated. Future research in this line of study must empirically investigate the processing of experiencing interacting with a persuasive AI. A better understanding of such processing can inform the subsequent further investigation and design of effective and efficient persuasive AI tools and infrastructure in the workplace.

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