

Enhancing Teamwork in News Media: A Design Science Approach to Human-AI Collaboration for Story Planning

Riccardo Bonazzi
HES-SO Valais // Wallis
riccardo.bonazzi@hevs.ch

Michelle Manify
Digital Content Next
michelle@digitalcontentnext.org

Gianluigi Viscusi
Linköping University
gianluigi.viscusi@liu.se

Heidi Gautschi
HEP Lausanne
heidi.gautschi@hepl.ch

Abstract

This ongoing study addresses the increasing need for human-AI collaboration in newsrooms through a conversational system to enhance teamwork. Our prototype leverages retrieval-augmented generation to provide features for content analysis and social networking. Expert evaluation validated the content analysis feature, while highlighting areas for improvement in expert-identification. The preliminary results offer practical insights and design guidelines for human-AI collaboration in news media organizations.

Keywords: teamwork; human-artificial intelligence collaboration; IS delegation; design science; digital transformation. conversational agent; news media

1. Introduction

This article presents an ongoing project that primarily targets managers in the institutional press and scholars examining the implications of the changing nature of the institutional press through digitization. In doing so, we give importance to small organizations, which are vital to obtaining local news but have strong budget constraints.

While popular discourse often exaggerates the job displacement potential of artificial intelligence (AI) and digitalization, a more nuanced understanding reveals that these technologies primarily influence specific tasks within jobs, rather than eliminating entire roles (Gagné et al., 2022). This shift necessitates increased human-machine interaction in the workplace, raising questions about task allocation between humans and AI, and the subsequent implications for work design (Parker, 2014). To address this challenge, we investigate how to leverage *human-AI collaboration* (Sturm et al., 2021) to enhance teamwork design in the institutional press.

Given the increasing agency of AI in the newsroom, we frame our research through the lens of *information system delegation* (Baird & Maruping, 2021), which emphasizes the dynamic transfer of rights and responsibilities between human agents and AI artifacts, and we aim to design a tool that empowers

journalists to strategically allocate tasks and decision-making authority between themselves and the AI.

We propose a design science approach to develop a *calm technology* (Weiser & Brown, 1996), whose encalming effect was relate to the fact that the “technology engages both the center and the periphery of our attention, and in fact moves back and forth between the two” (*Ibid.* page 3). Thus, a calm technology seamlessly integrates into established workflow and that aligns with the need for newsroom tools to augment collaboration without causing undue disruption or cognitive overload.

Therefore, our **research question** is: how to design a *calm technology* that supports *team-AI collaboration* to improve teamwork in news media organizations?

2. Related work

Organizational Behavior theories. Organizational behavior (OB) research emphasizes that managing technology's impact on work is not solely an individual responsibility, and that organizational and technological design choices influence work design outcomes (Gagné et al., 2022). Accordingly, this paper focuses on teamwork design, using the framework of Braun et al. (2023) to determine *task delegation to virtual agents*.

Information Systems theories. Drawing from information systems research, we build upon Cvetkovic et al.'s (2023) work in *natural language processing chatbots* for team ideation by using Baird & Maruping's (2021) framework on *task delegation to virtual agents* and by making explicit the notion of *calm technology* (Weiser & Brown, 1996) to give detailed instructions to help a under-resourced local news organization build a system that unobtrusively assists journalists when needed.

GenAI in the media industry. On the one hand, media companies are developing their own AI-powered tools, such as Forbes' generative AI search platform in collaboration with Google (David, 2023), The Washington Post's AI chatbot in collaboration with OpenAI (Fischer, 2024). and the Financial Times' Ask FT chatbot in collaboration with Anthropic (Rahman, 2024). On the other hand, firms

with limited budget and that are not tech-savvy: might rely on low-code platforms such as Kore.ai and Cognigy.AI, which are leaders in the conversational AI space (Bern & Rigon, 2023).

Knowledge gap. Ultimately, our research fills a gap in the existing literature, as evidenced by the limited number of design guidelines for human-AI collaboration in teamwork settings.

3. Methodology

In this section, we briefly describe our argument for why we have chosen design science research and how we made our prototype. We followed the steps proposed by Peffers et al. (Peffers et al., 2007) to develop a conversational system that helps members of a team in a news organization work together across roles.

Problem identification. Through twenty semi-structured interviews with news media professionals, we identified six software-associated processes via topic modeling analysis. Clustering analysis revealed three distinct user groups: 1) *Content Creators/Managers*: Reporters, editors, and managers utilizing software for content creation and management; 2) *Business Intelligence/Project Managers*: Executives employing software for business intelligence and project management. 3) *Data Managers*: Directors overseeing data management software.

Figure 1 shows the results of the interviews. Notably, all job titles utilized communication software (primarily Slack), prompting us to search for a Slack-integrated conversational agent, similar to Cvetkovic et al. (2023) and we decided to focus on story planning as a content management task across two user groups. Accordingly, we dismissed a few alternatives that were too advanced for small firms (e.g., wrappers around existing LLMs) or delivered a final product (AI-created news outlets such as *ground.news*).

Job Titles	Jobs to be Done	Content creation	Business intelligence	Data management	Project Management	Communication
Reporter, Business Pages Co-op, Tech Reporter, Enterprise Reporter, US Editor, Deputy Coverage Chief, Executive US News Editor, Managing Editor, Media Deals Reporter	To inform (and increasingly, nullify misinformation), provide truthful information, give the public actionable information, set records straight/hold accountable, inform/build trust/stand up for democracy, provide Smart Brevity for shrinking attention spans, inform/entertain young people, shape/craft news, inform dealmakers, keep citizens up to date, promote rational, evidence-based information	■	■	■	■	■
Executive Editor	To equip the audience with information for daily decisions and future planning.	■	■	■	■	■
News Director, Director of AI Products and Services	To educate voters for informed decisions, to help news organizations collaborate for greater impact.	■	■	■	■	■

Figure 1. Problem identification.

Objectives of the solution: Building upon Cvetkovic et al. (2023) four design principles for conversational

agents for teams, our interviews revealed the need to extend these features (Figure 2). We observed experts' approach to fuzzy tasks, in line with the insights about technology and teamwork from Braun et al. (2023). This led us to create a feature allowing both structured processes for novices and unstructured inquiries for experts (DF2.2). Additionally, we make explicit the notion of calmness (Weiser & Brown, 1996), which means ensuring that the AI assistance complements human judgment rather than overwhelming it. (DF3.2). We wrote Python scripts for document anonymization and metadata extraction (DF4.1), and we introduced the notion of flexible delegation, allowing journalists to determine the level of autonomy they grant to the AI for tasks (DF4.2).

Source	Design principle	Design Feature
Cvetkovic et al.,(2023)	DP1: Task and process assistance	DF1: NLP fine-tuned with domain-specific data
Cvetkovic et al.,(2023)		DF2: Predefined dialog structure that follow the ideation process
New		DF2.2: No structure for experts' use
Cvetkovic et al.,(2023)	DP2: Natural language communication	DF3: NLP modules and an integration of the CA to Slack via API
New		DF3.2: Calmness
Cvetkovic et al.,(2023)	DP3: Information distilling and enrichment	DF4: Custom script for storage, clustering and visualization of user input in real-time
New		DF4.2: Script for document anonymization and metadata extraction.
New		DF4.3: Flexible delegation
Cvetkovic et al.,(2023)	DP4: Human-likeness	DF5: Nudges and human-like answers defined in the training data; help functions.

Figure 2. New objectives of the solution.

Design and development. Among the different market solutions discussed in previous sections, we opted for Cognigy AI to develop our prototype, as it enables the creation of conversational agents that can be maintained by non-technical users and deployed both on Slack and the web. Leveraging its knowledge database for retrieval-augmented generation, we employed OpenAI's GPT3.5 Turbo for content generation, demonstrating affordability for businesses with limited resources.

For the sake of brevity, we explore only some relevant features of the prototype in this paper, but we share a link, which can be used to test the prototype on the web during the HICSS conference: <https://cutt.ly/DenwiiKF>. A Python script anonymized interview transcripts with 20 experts and generated metadata linking each person to their job title, tasks, software used, and views on the role of news media. Cognigy converted this text into chunks.

Figure 3 showcases the system's two primary features, enabling users to query existing content and identify relevant individuals for collaboration. AI-generated story suggestions are presented discreetly within the Slack sidebar, and notifications are non-intrusive. Our Slack plug-in incorporates features that facilitate IS delegation: users can ask a range of queries for the AI, from simply receiving story suggestions to having the AI automatically filter and prioritize news sources based on predefined criteria.

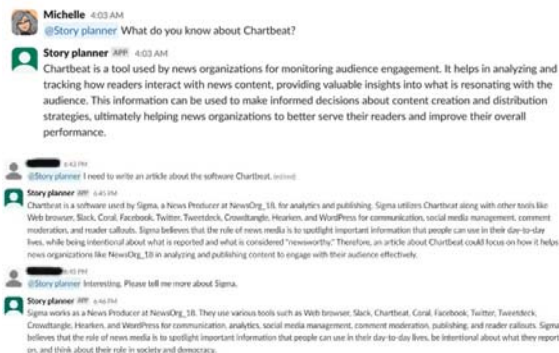


Figure 3. Features of the Slack Plugin.

Demonstration and evaluation. We presented our prototype to a panel of experts, asking them to estimate if delegation of some tasks to AI would improve their performance (link: <https://cutt.ly/JeQHcQqX>).

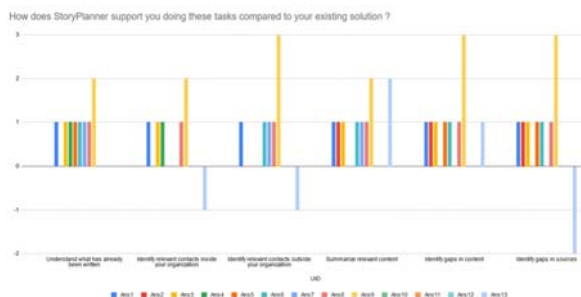


Figure 4. Test results (<https://cutt.ly/neQGXFYu>)

Figure 4 shows the scores obtained by 13 participants concerning six tasks. A positive delta indicates that our solution is better than the existing one (link to the data: and detailed analysis <https://cutt.ly/LeQG8G8Z>). Only one participant described our solution as worse, supporting our intuition that our calm technology approach resonated with newsroom professionals: participants appreciated valuable insights without unnecessary distractions. Nonetheless, the ex-post analysis of the 95% confidence interval (Levine & Ensom, 2001) shown in the detailed analysis mentioned before suggests that more data collection is required.

4. Discussions and conclusions

The purpose of this study was to explore how to design a calm technology that supports team-AI collaboration in news media organizations. Our prototype has shown promise in content analysis, but the expert identification feature requires further refinement based on mixed evaluations. This highlights the need for iterative design and user

feedback in developing AI tools for specific tasks and preferences (Sturm et al., 2021). Future iterations will expand the evaluation to include a larger and diverse group of users, and we will assess the prototype's impact on various aspects of story planning.

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