Building an AI-Powered Process Assistant

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1. About the Case

The Process Assistant tool described in this case study is an open-source prototype, built to demonstrate capabilities and understand constraints in applying AI to process and knowledge management. As an entry to an AI hackathon on the Coda platform[1], approx. 100 individuals and small- to medium-sized organisations have downloaded a copy of the tool.

2. About the Challenge

In my experience, organisations undervalue process management, and it remains an under-developed skill in workers. Many knowledge workers believe that their work is too specialised to be documented as process, and fewer still have implemented a structured approach to capturing, synthesising, and integrating feedback into their work. As a result, organisations and workers are missing out on opportunities to adapt to fast-changing business landscapes and to create solutions for issues related to culture and personal wellbeing.

Typical process inventories provide a number of benefits to an organisation and its people, mostly related to the creation of explicit knowledge resources (e.g., moving knowledge out of heads, and making it explicit so that it can be analysed, clarified, and transferred.) However inventories are static, require significant maintenance to keep pace with the actual work, and require users to seek information following a pre-established taxonomy. Knowledge bases are often located at a distance from the work itself, making it difficult to ensure adherence and integrate worker feedback.

3. What I Did

I developed an open-source AI-Powered Process Assistant to explore and experiment with concepts related to process and knowledge management, artificial intelligence, and enhancing learning through feedback. The tool aims to bring process management to the worker's immediate context of performing the work. I leveraged Artificial Intelligence (AI) to lessen the worker effort required in process management.

The tool is built using the Coda platform, a no-code work management SAAS with deep connections to standard work management products and platforms (e.g., Salesforce, Teams, Slack). Coda's AI integration is in public beta and uses OpenAI's GPT-3.5 Large Language Model (LLM). To use AI in Coda, builders construct prompts that reference databases within the tool and the AI generates a response from both the internal database and external LLM.

The Process Assistant workflow begins when a user creates a process and its steps using AI or manual entry, for example an employee onboarding process.

Then, when a worker needs to onboard a new hire, they create an iteration of the source process (a "project") and its steps are copied as tasks and appear in the worker's task schedule. As the worker engages with their tasks, they can provide feedback on issues that arise. Feedback is linked to the source process and step and is used to develop recommendations for process improvement before the next iteration.

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[1] https://coda.io/

The Process Assistant uses AI in four places, with all AI responses referencing baseline information on the nature of the organisation (e.g., industry, mission, vision, values).

- *Create a Process:* by way of user prompt (e.g., "I need an onboarding process for new hires"), the AI generates a process, the steps to complete it, estimated durations for steps, and written descriptions of the steps and process. The user can modify this.
- *Ask a Process:* users ask questions of a process in plain language, such as "do we have a knowledge transfer checklist?", and the AI provides a response that references the information in the process and cites a related process step for reference if applicable.
- *Create Work Resources:* the AI generates suggested checklists, templates, outlines, and other resources to guide workers through completing a process step. These can also be edited by the user.
- *Improve a Process:* the AI summarises worker reflections against a process and provides recommendations for improvement, which the process owner can adopt or adapt.

4. Challenges and Lessons Learned

Short Development Window
I built this tool for *Coda's AI at Work Challenge*[2], a hackathon to generate AI-supported templates for the broader Coda user-base. The development window was approximately three weeks, which did not leave sufficient time for robust user testing and required that I leave many features and improvements on the cutting room floor. Although I have built process and knowledge management systems for clients in the past, the integration of AI was new to this iteration, and I would gladly have taken another few weeks to experiment and validate the functionality.

Prompt Engineering
Working with AI via prompts can feel like a black box scenario, in which the capitalization of a single letter may change the AI's response. Early prompts returned "hallucinations" and false responses, where a query such as "do we have a set of interview questions?" resulted in the invention of questions in spite of the presence of a knowledge resource already within the system. Through experimentation, I found the following practices resulted in better accuracy and more focused responses:

- I assigned the AI a persona - in this case as the embodiment of a process - before defining any other requirements. The AI is fed process information, 'adopts' the process as its persona, and holds it in reference as it generates its response.
- I referenced a description of the nature of the organisation in the prompt to help the AI understand the context from which to generate its response
- Prompts were explicit about the desired behaviour under certain conditions, for example, "If the answer isn't in the background information, it is critical that you state this in your response, then do your best to provide an answer anyway." This greatly reduced the frequency of hallucinations. Despite explicit direction, AI responses still occasionally ignore requests, for example providing a bulleted list when directed not to.

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[2] https://coda.io/blog/ai/ai-at-work-challenge-winners

Limited Prompt Size
Where AI products like ChatGPT can reference extended conversation history, this tool is limited to around 2,000-3,000 words per prompt because of the limitations of the Coda API. This limit is sufficient to include reference to modest-sized processes, including their process description, steps and step descriptions, several knowledge resources, and the summary of the organisation. Due to the limited size, I was unable to incorporate information about worker roles and past chat history to better inform responses. Future versions of the tool will require restructuring to improve on this limitation (e.g., a standalone product with direct integration to an LLM.)

AI Cost
Coda AI is in public beta and is available for free to Coda users with no cap on AI usage. Eventually Coda is expected to monetize the service and release a pricing structure for AI use, potentially based on the number and size of prompts. At that time, tools such as this AI Process Assistant could become cost prohibitive within the platform due to the large prompt size inherent in querying internal knowledge resources. Regardless of the third party AI provider, we should expect to see variable pricing structures over the next few years, and this will be a primary consideration for businesses developing and implementing AI-based tools.

User Effort & Trust
The current state of AI requires some effort on the part of the user to validate responses. No matter how often or loudly this is stated, users will forget or disregard, taking responses for truth. An AI-generated process requires the process owner to edit and augment with details specific to their organisation and context. There remains unquantified uncertainty and risk in the use of this tool, as users make decisions based on AI responses.

5. Impact and Benefits
While the tool has only been public for two weeks, Initial user feedback has been positive, particularly where organisations had no previous process inventory or had not implemented process management across their teams. People appreciate the ability to 'converse' with their processes, get a quick answer, and forego searching for and reading lengthy documents.

For some users, this is their first exposure to feedback loops and continuous improvement. They are intrigued by prompts to consider their work, its tensions and frictions, and how their small suggestions can scale to large improvements. By integrating feedback at the task level, the tool helps users identify emerging issues without having to reference a process.

6. Next Steps
Morning Strategy's goal is to create a standalone product that incorporates and builds beyond this AI Process Assistant. Our vision of the future is one in which workers can sense, understand, and navigate an organisation as easily as using Google Maps. Workers need to see how their work is connected to the customer, to other work in the organisation, to the external environment, and to work and entities in the organisation's past and future (strategy). Organisations need the ability to see and understand themselves as a system of perspectives, where an organisation's existence, purpose, and strategy emerge from the actions, perspectives, and input of each worker.

The path to this vision requires further development of organisational knowledge tools like this Process Assistant. Morning Strategy is currently seeking partners to develop a version 2.0 of this tool within Coda, with the product roadmap including the following features:

- User permissions to separate the responsibilities of process owners from workers
- Rigorous testing to establish the accuracy and limitations of AI responses
- Breakout backend prompts so that users can customise the AI's responses
- Inclusion of other primary knowledge resources beyond processes
- AI-supported tagging to aid in linking, finding, and understanding knowledge
- AI-agents to embody tags and other aspects of the tool, allowing users to query knowledge across established resource types
- Robust conversational attributes, e.g., AI helping to clarify root causes of an issue
- AI prompts to users, for example to consider process feedback when working on a specific task, and empowering AI to query users for missing information