

Applications of GenAI for Entrepreneurs

This paper will demonstrate that Generative AI (GenAI) will support ambitious entrepreneurs primarily by offering new perspectives and solutions to their innovation challenges.ⁱ Beyond this creative role, it will also automate routine cognitive tasks, thereby freeing up valuable time for entrepreneurs to focus on critical strategic decisions. The combination ensures that the entrepreneur's intellectual efforts are most efficiently allocated, significantly improving both the pace and quality of their venture's development. This promises to redefine entrepreneurship, marking a shift as significant as the one experienced with the advent of startup accelerators, triggered by the emergence of cloud and mobile platforms.ⁱⁱ

GenAI as a "Co-Founder"

In most situations, GenAI should serve as a tool to assist ambitious entrepreneurs, providing guidance and information, rather than taking full control and independently conducting their work. A helpful mental model is to encourage entrepreneurs to think of GenAI tools as an extra co-founder on their team but not the final decision maker. Put another way, it's *not* that GenAI is the CEO and Co-Founder of the startup, but another co-founding partner in the startup providing input, ideas and doing some of the routine cognitive work.ⁱⁱⁱ

Conceptually, this is very similar to the work that Google DeepMind used when developing a system they called "Dramatron" which collaboratively acted as a co-writer of scripts and screenplays with 15 different professional writers over 2 hours for each writing session. Five of these scripts were produced and staged at North America's largest theater festival, the Edmonton International Fringe Theatre Festival in August 2022. At the festival, each of those five scripts contained both overall context for the entire play and a detailed script for the first half. This information was provided to professional improv performers in a sealed envelope at the start of the performance. The actors read the first half of the script and then improvised the ending based on the information provided in the materials given. The performances received overall positive reviews from critics, actors and human co-writers. The DeepMind team concluded this work provides "a pathway toward human-machine co-creativity that uplifts human writers and artists while leveraging novel artificial intelligence systems such as LLMs."^{iv}

In Section 2, this paper will show how when entrepreneurs look at GenAI as their co-founder, the support provided by these tools can extend across all three phases of their startup: ideation, idea validation and scaling up providing a similar role uplifting entrepreneurs to co-create.

In Section 3, the paper will discuss three common conceptual mistakes and the proper approach to overcome each of these - specifically emphasizing the importance of: 1) proper prompts, 2) decomposition of tasks to be accomplished iteratively and 3) integration with additional data and systems.

After that, in Section 4, the paper will take a deeper look at different approaches an entrepreneur could take to one task - specifically brainstorming ideas for a new venture. But

rather than simply accomplish this task one way, the paper will provide three different approaches that tie back to the three solutions laid out in the previous section.

Finally, the paper will conclude looking forward to the challenges and opportunities for GenAI and entrepreneurship.

When this paper refers to “entrepreneur” it is talking about any individual who engages in the activity (by themselves or as part of a team) of creating new products or services for a market. This activity could be done to support a new enterprise or within larger established companies collectively described as “ventures”.^v

GenAI for Corporate Entrepreneurs

Before moving to Section 2, let's focus specifically on the subset of entrepreneurship occurring inside established companies and how GenAI can impact that work. Over the last year, there has been a significant increase in business leaders' interest in GenAI. Most executives agree that GenAI will be transformational to their organizations, but they aren't confident how to get started. For example, in a recent KPMG survey, 65% of executives think that GenAI will have a high or extremely high impact on their companies. However, the same survey also revealed that 60% of these executives believe they are still one to two years away from actually implementing any GenAI solutions.^{vi}

This disparity between expectation and readiness for GenAI suggests a window of opportunity for corporate entrepreneurs to illustrate what GenAI can truly achieve. In many ways, this will be analogous to the late 1990s when the “dot com” experiments were driven out of innovation groups before internet technologies were ultimately integrated as an enabling technology across business functions.^{vii} We expect the same ultimate impact across areas for GenAI as the technology matures, but also innovation to be the function most companies start with.

The good news is that the impact will likely be significant. McKinsey recently conducted a study examining the potential economic benefits of implementing GenAI technology in various business operations. Their analysis of research and development (R&D) points to untapped opportunity in large companies, explaining:

Generative AI's potential in R&D is perhaps less well recognized than its potential in other business functions. Still, our research indicates the technology could deliver productivity with a value ranging from 10 to 15 percent of overall R&D costs.^{viii}

Section 2: How GenAI Can Support Entrepreneurs' Processes

Regardless of whether done inside a large company or at a brand new enterprise, entrepreneurship is an inherently creative process and individuals can't take a formulaic approach. That said, generally, the work accomplished flows into three broad steps to turn an idea into a profitable venture:



Figure 1: An overview of the 3 Phases Entrepreneurs Go Through to Develop a Venture

1. *Ideation*: At this phase, entrepreneurs conceptualize potential business ideas and come up with quick descriptions of the concept. This involves tapping into creativity, recognizing market gaps and envisioning solutions to specific problems.
2. *Idea Validation*: During this phase, entrepreneurs test and refine their ideas to ensure there's a genuine market need. They gather feedback, conduct market research and prototype their proposed solution. The primary goal is to determine if the business concept is viable and if it offers a compelling value proposition to potential customers.
3. *Scaling Up*: Once the business idea has been validated and shows signs of traction, entrepreneurs focus on growth. They optimize operations, expanding market reach, hiring additional staff and often secure larger rounds of financing.

The remainder of this section will provide examples of how GenAI can support each of these three phases.

GenAI Impact on Phase 1: Ideation

Recently, the rise of GenAI has introduced a novel dimension to ideation. Platforms can serve as on-demand collaborators: offering instant feedback and generating alternative ideas that build on the entrepreneur's concepts.

Section 4 of this paper, as mentioned in the introduction, will explore in detail different approaches that a GenAI system could support brainstorming. Other examples of ideation processes that can be supported by GenAI include:

1. *Developing Project Names & Taglines*: Naming a project or crafting a catchy tagline can be a challenge, but it's pivotal for branding and market positioning. GenAI can generate a variety of name and tagline options based on the business concept.^{ix}
2. *Mind Mapping Assistance*: Visualizing interconnected ideas can help in structuring thoughts and uncovering potential areas of exploration. GenAI can assist in auto-generating mind maps based on an entrepreneur's initial inputs, suggesting related ideas or industries to consider.^x
3. *Competitive Gap Analysis*: By analyzing the current competitive landscape, GenAI can pinpoint gaps in offerings, helping entrepreneurs identify niches or underserved markets. This ensures the business idea is not just innovative but also addresses an existing market void.^{xi}

4. Developing an Ideal Customer Profile (ICP): Even in the early stages of ideation, having a clear picture of the potential target audience can be invaluable. This ICP lays out the potential characteristics, motivations, and pain points of a target segment, giving entrepreneurs a focused lens through which they can shape and refine their budding business ideas. However, entrepreneurs often find it difficult to develop the initial hypothesis of their ICP and GenAI is often very useful for this.^{xii}

GenAI Impact on Phase 2: Idea Validation

Idea validation has always been a crucial step in the process of entrepreneurship. However, in the late 2000s this process underwent a significant transformation. A wave of disruptive technologies, such as Ruby on Rails, cloud computing, and the introduction of robust mobile development platforms like iOS and Android, enabled entrepreneurs to accomplish what up to that point was unprecedented speed and efficiency.

Today, all three of these technologies feel common, but each of these three solutions were transformational to entrepreneurs at the time. Ruby on Rails changed the process of application engineering from writing solutions from scratch to integrating libraries of common functionality (called Gems)^{xiii} enabling much faster initial prototypes where most of the engineering effort focused on unique features instead of common core functionality. Cloud computing changed the infrastructure costs of developing a solution from an upfront capitalized expense to an ongoing operational costs.^{xiv} And mobile platforms allowed developers almost instant access to potential customers after an automated review^{xv} instead of requiring direct individual negotiations with carriers and OEMs.

In response to this technology disruption, a new form of early-stage venture funding appeared - startup accelerators. Initially led by Y Combinator and TechStars, this model quickly proliferated and there are now over 3,000 similar programs globally.^{xvi} The impact of this spread well beyond web and mobile startups. One only needs to look at the ubiquity of accelerators today working in sectors as diverse as climate change, hardware and life sciences.

Around the same time, industry thought leaders Steve Blank and Eric Ries developed 'The Lean Startup' methodology. This framework formalized the innovative strategies that entrepreneurs were utilizing, providing a blueprint for startup development.^{xvii}

GenAI introduces similar transformative capabilities to this validation process to what occurred in the last 2000s. Entrepreneurs can accelerate the prototyping process, at multiple levels of fidelity,^{xviii} allowing testing of multiple variations in condensed timeframes, ensuring a more comprehensive validation. Below, are examples of how GenAI can support prototyping concepts at different levels of fidelity:

1. Storyboards: GenAI facilitates the quick generation of visual storyboards, based on narratives defined by the entrepreneur or created in collaboration between the entrepreneur and their GenAI Co-Founder. This allows for a preliminary validation of

how well the user journey or product features resonate with the target audience's actual needs and preferences.^{xi}

2. Landing Pages: With GenAI's custom landing page designs, entrepreneurs can precisely craft multiple versions of the page, each emphasizing distinct yet similar value propositions. This allows for nuanced A/B testing, minimizing the risk of false signals that can arise when using generic templates and stock photography, which may inadvertently align with different value propositions.^{xx}
3. Wireframes: Using GenAI's auto-generation features, entrepreneurs can efficiently create wireframes that serve as a visual representation of the application or website. These wireframes help in determining if the envisioned solution aligns with the needs and expectations of the initial Ideal Customer Profile (ICP).^{xxi}
4. Manual Prototypes: GenAI streamlines the development of manual prototypes that simulate specific product features. Using GenAI to automated guidance, entrepreneurs can more effectively mimic specific features. This aids in early-stage validation and gives entrepreneurs a clearer picture of customer needs and preferences.^{xxii}
5. Single Feature Products: GenAI provides the necessary resources for launching a single-feature product for rapid testing allowing entrepreneurs to efficiently validate customer interest through real-world usage and feedback.^{xxiii}

GenAI Impact on Phase 3: Scaling Up

While each venture may scale differently, there exists a science to growth, underpinned by a few common challenges: penetrate market segments, optimize operations and often secure significant capital injections. For each of these challenges, GenAI can now be a valuable partner, supporting entrepreneurs towards informed growth decisions.

1. Go-To-Market Plans: The right go-to-market strategy can be the difference between a thriving business and one that never gains traction. GenAI supports the development of robust go-to-market plans which entrepreneurs can fine-tune, together ensuring alignment with validated customer needs and preferences from the earlier phases.^{xxiv}
2. Revenue Model Strategy Refinement: A revenue model is the subset of an overall company's business model focused on how that organization captures value. Part of this is exploring the correct overall model (ex: subscription vs transactional) but it's also key to optimize pricing strategies for a given model. GenAI can analyze competitor revenue models and pricing, market demand, and consumer sensitivity to recommend optimal pricing strategies.^{xxv}
3. Pitch Deck Development: Crafting an effective pitch deck is often a crucial step for securing investment. GenAI can significantly streamline this process by recommending slide structures, key talking points, and even produce draft slides that align with the venture's objectives and market opportunity. This enables entrepreneurs to focus on the narrative and persuasion aspects, while confidently relying on GenAI for the foundational content and layout.^{xxvi}

Section 3: Conceptual Approach to GenAI Supporting Entrepreneurship

Entrepreneurs, along with many other early adopters, have mixed opinions on how useful GenAI will be. As an example, many people's first exposure to GenAI tools came through ChatGPT from OpenAI. The app grew to 1 million users in five days^{xxvii} and then over 100 million monthly active users in two months making it the fastest growing consumer web app in history.^{xxviii} The chat based interface provided an "aha" moment for many people of the potential power of GenAI. Even with ChatGPT's popularity, the reviews continue to be mixed on its usefulness.^{xxix}

In conversations with leaders who have been underwhelmed by the results, regardless of which GenAI tool is used, this is often the result of making one of three conceptual mistakes:

- **Wrong Prompt:** While a specific prompt may feel correct to the user, sometimes it may not demonstrate an understanding of how models actually work to generate their results.
- **Wrong Expectation:** They expect the Generative AI to completely accomplish a complex task in one interaction.
- **Wrong Scope:** Finally, sometimes the problem is that GenAI is part of the solution, but it often needs to interact with other data or systems.

With these in mind, the rest of this section will provide a detailed explanation of the proper perspectives entrepreneurs should apply to solve each of these three conceptual mistakes. Then section 4 will apply these correct approaches to a single entrepreneurial task: brainstorming venture concepts.

Solution to Wrong Prompt: Proper Prompting

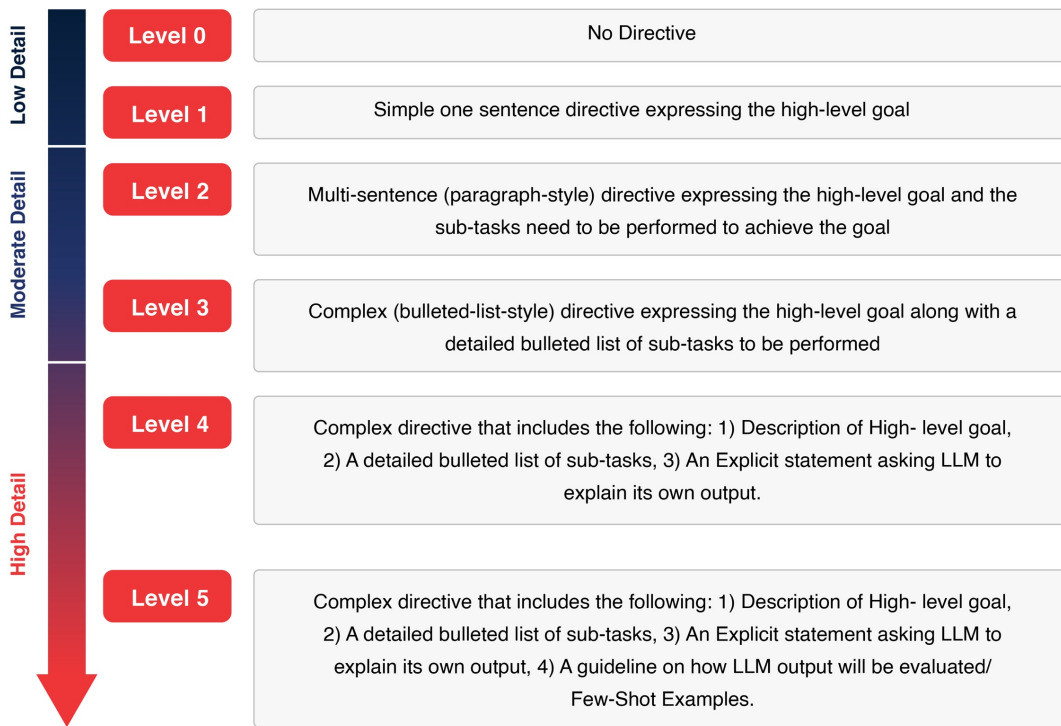
Understanding how the models operate is crucial when interacting with a GenAI tool. This is especially true for large language models (LLMs). The right prompts are crafted with both the task and model's capability in mind. Sam Altman, CEO of OpenAI explained it as follows: "writing a really great prompt for a chatbot persona is an amazingly high-leverage skill and an early example of programming in a little bit of natural language"^{xxx} Large companies are realizing this, with reports of some companies paying \$335,000 salaries for individuals focused on writing good prompts.^{xxxi}

Until recently, there was no established taxonomy for these prompts, but recently an general taxonomy called "TELeR" has emerged for LLMs.^{xxxii} While it evaluates prompts along four dimensions: number of Turns, Expression style, Level of detail and Role (the underline letters show the resulting acronym "TELeR"). For entrepreneurs, typically the most important dimension is typically "Level of Detail" which the authors specifically explain as:

Based on whether particular aspects of the goal task definition is present or absent in the directive, prompts are divided into six distinct levels. Here, aspects refer to clear goal definition, sub-task division, explanation seeking, providing few-shot examples, etc. By definition, Level "0" means minimal details, i.e., no aspects/no directive; while level "5" means the highest level of details where the directive includes clear goals, distinct sub-

tasks/steps, an explicit requirement of explanation/justification, well-defined criteria for evaluation and/or few shot examples.^{xxxiii}

The image to the below is adapted directly from their paper showing definitions for the six levels of detail:



Source: <https://arxiv.org/abs/2305.11430>

Figure 2: An overview of the Five Levels of Detail for LLM Prompts (from TELeR taxonomy)

One technique from Level 5 in the taxonomy that has proven particularly powerful in prompts for entrepreneurship is providing past examples of successes often referred to as “few-shot examples.” The term ‘few-shot learning’ originates from a machine learning (ML) technique where ML models can generalize knowledge from a limited number of training examples.^{xxxiv} This technique has demonstrated proficiency not only in tasks such as image classification but has also recently shown to be effective in Language Model Learning (LLMs).^{xxxv}

A subset of this few-shot approach, which has worked particularly well for entrepreneurship tasks is where as part of that example includes the logic used to reach the desired outcomes is also provided to inform the model. This is sometimes referred to as “Chain-of-Thought Prompting” because the prompt fully expresses the flow or chain of thinking used to come up with the answer. The importance of including this in prompts is relatively recent, because researchers have demonstrated that the impact of chain-of-thought prompting only occurs when LLM models have over 100B parameters.^{xxxvi} As an example, this would mean the technique would not have been relevant until GPT-3 was released because GPT-2 had 1.5 billion

parameters while GPT-3 had 175B parameters.^{xxxvii} It also shouldn't be surprising leveraging chain-of-thought prompting is important for entrepreneurship tasks as research has also demonstrated greater impact on more complicated problems.^{xxxviii}

Solution to Wrong Expectation: Proper Decomposition

For complex tasks GenAI works best iteratively. Breaking down tasks into subtasks and then stepping through each subtask can result in more accurate and nuanced outputs. It also is more adaptable, because when approached as a sequence of prompts, the system can refine its outputs based on previous interactions, tailoring results with increasing specificity. Entrepreneurs can also provide guidance when necessary to ensure a correct and comprehensive exploration of the concept at hand. Increasingly, this is being accomplished programmatically using tools like Langchain^{xxxix}.

Some of this work to achieve proper deconstructed and detailed prompts (i.e. both perspective 1 & 2 above) may be done & hardcoded into the system before the entrepreneur interacts with it. The analogy to the Dramatron system described in the introduction is again helpful. In that case, the DeepMind team explains the following programming had been done to setup the system before writers sat down to co-write scripts:

Dramatron uses several hard-coded prompts (i.e. input prefixes) to guide the large language model. ... Prompts are concatenated with user-supplied inputs and/or outputs of previous LLM generations. This method is called prompt chaining, which is a type of algorithmic prompting.^{xi}

Solution to Wrong Scope: Proper Integration

Recognizing GenAI as a component within a broader system can elevate its potential. By ensuring seamless interactions between the AI and external data or tools, one can extract the most value and versatility from the model. The most widely understood example of this is ChatGPT's plugin architecture.^{xii} However, the broader implications become quite compelling as you dive into what these integrations could offer.

Using LLMs as an example, researchers from OpenAI and Wharton collaborated to estimate that 15% of all tasks completed by US workers could be automated using LLMs alone but when the incorporated into software systems built on top of LLMs that percentage increased to between 47% and 56% of all tasks.^{xlii}

While absolutely critical for the success of GenAI in many applications, unfortunately many enterprises today are struggling to work through these integrations. A recent survey by leading Venture Capital firm Insight Partners found that 44% of respondents felt integrating GenAI tools into their existing workflow was the most significant obstacle toward adoption.^{xliii} This was the most selected response being chosen more than: not sure which tool to use (23%) and privacy concerns (10%).^{xliiv} It's obviously early in the technology's development, but as a field, we have a long way to go to ensure it's easy for leaders to integrate these solutions.

Finally, when thinking about integrations these models are not exclusively producing text, but also may involve text-to-image models such as OpenAI's DALL-E, StabilityAI's Stable Diffusion or Midjourney.

Section 4: Brainstorming Deep Dive

This section will explore how entrepreneurs can harness GenAI to collaboratively brainstorm innovative concepts. For many entrepreneurs, this is one of the first powerful use cases they experience using tools like ChatGPT. Aaron Levie, the founder of enterprise technology company Box recently explained on Twitter^{xiv}:

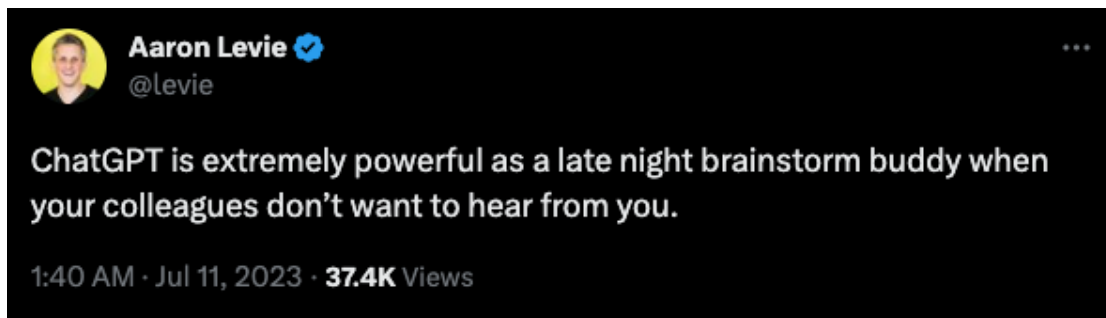


Figure 3: Aaron Levie Tweet on ChatGPT as Brainstorming Partner

Aaron has become one of the outspoken champions of ChatGPT and more generally the impact GenAI will have on business today. While later in this section, we'll dive deeper into more advanced techniques. The initial important exploration is how an entrepreneur might attempt to brainstorm using a single comprehensive prompt.

As previewed in the last section, the TELeR taxonomy is helpful here. This is a complex problem so a high level of detail will be useful for the GenAI system. The entrepreneur should include all 4 directives for a level 5 prompt to get the best results. The image below sets up a prompt that would achieve this. The blue underlined text in <angle brackets> are placeholders and would need to be filled in based on the specific idea being brainstormed.

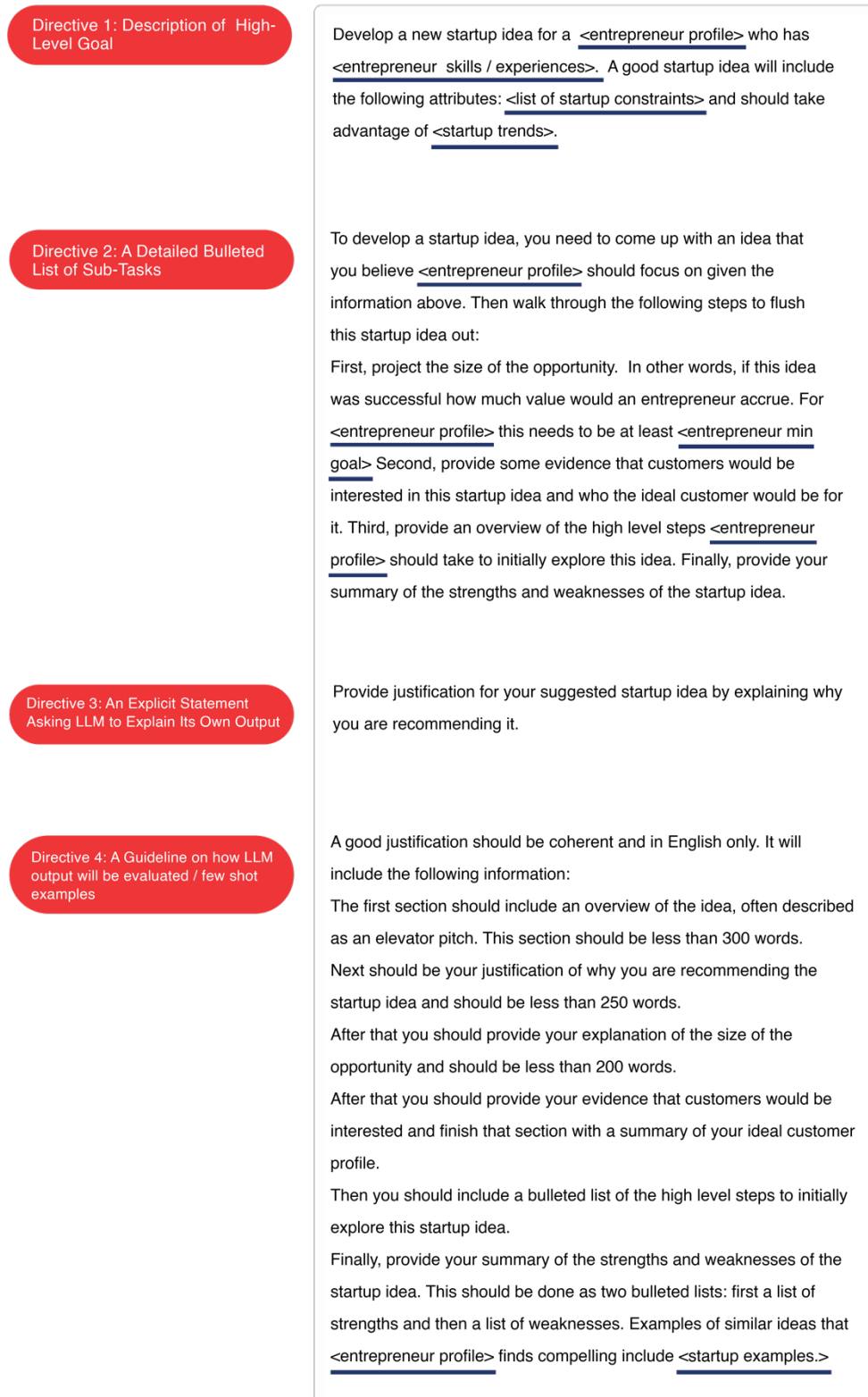


Figure 4: An Example Prompt Template for Brainstorming a Startup Idea

As described in the last section, an entrepreneur also might provide past examples to inform the model (chain-of-thought prompting). To do this, the placeholder <startup examples> would need to become much longer, with the example not only being an example they find compelling but also an explanation for each example of how the system would have answered directive 2 & 3 based on this example.

However, a singular prompt like above is only our first example; the subsequent two examples will expand on refining and elevating this approach to maximize its potential.

Brainstorming with Proper Decomposition

As mentioned in the last section, sometimes the best approach for GenAI is to break a task down into subtasks and then step through each subtask. While in practice, this can occur in a number of different ways, within the realm of brainstorming the most straightforward way to think about this is applying one of the common brainstorming frameworks to help think through the sequence of subtasks to be accomplished.

The TRIZ Methodology serves as a compelling illustration. Conceived by Russian patent examiner Genrich Altshuller in the late 1940s, the core philosophy of this brainstorming method is that all innovation is actually invented using one of 40 universal principles.^{xlvi} This has become popular in many areas of product design over the last 20 years, starting with Samsung's repeated commercial success in the early 2000s using this methodology.^{xlvii}

Think of these 40 principles as lenses to look at a problem you are brainstorming solutions for. Typically today it's used as a methodology where the first step is to train employees on the 40 principles such that they can look at a problem and intuit which of these 40 techniques would be most promising. Then they can try to apply that approach to come up with an innovative solution.^{xlviii}

However, with GenAI you can take a much more systematic approach. A system could be developed that creates 40 separate prompts for each of the universal principles. The prompt could use chain-of-thought prompting to provide detailed prompts with examples and an explanation of how the provided example leveraged that universal principal technique. In this way, leveraging a tool like Langchain you could run the same general problem through all 40 principles quickly and then a subsequent LLM can then sift through these, highlighting the most fitting and promising concepts based on a specific criteria.

An early prototype developed in Langchain (see figures below) has shown promising results, but has not yet been systematically tested for efficacy.

Ultimately, TRIZ is just one of a set of brainstorming methodologies that should be codified into a set of sequential prompts to support entrepreneurs brainstorming. But it does illustrate the point that single prompts are typically insufficient for complex problems, like many of those entrepreneurs address.

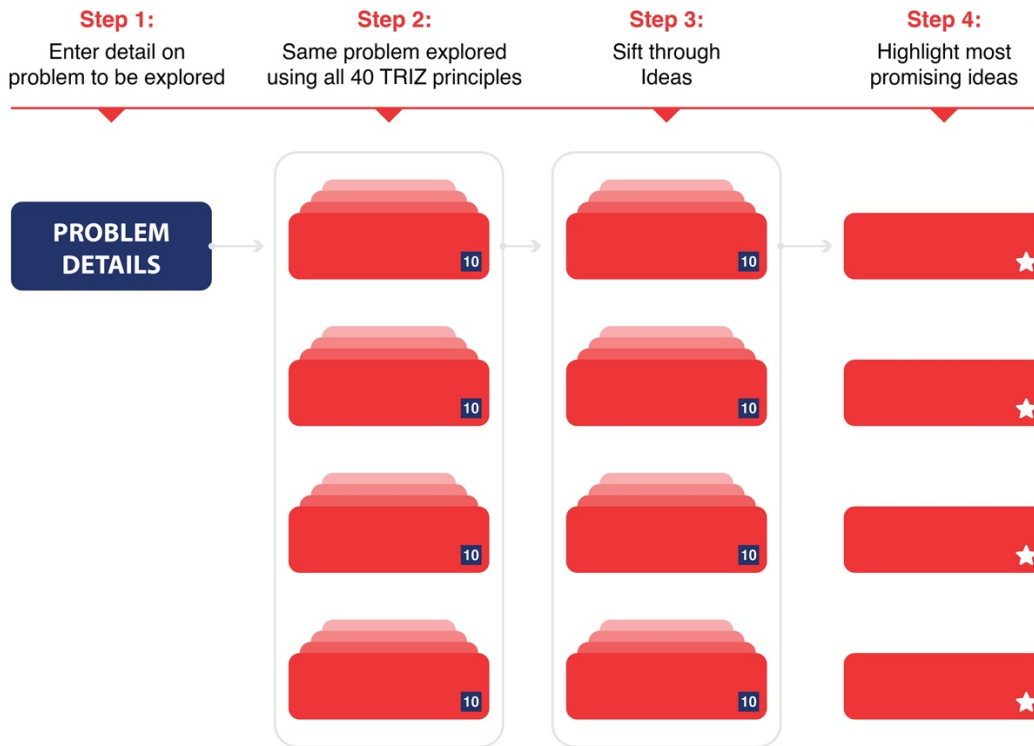


Figure 5: Overview of TRIZ Brainstorming System

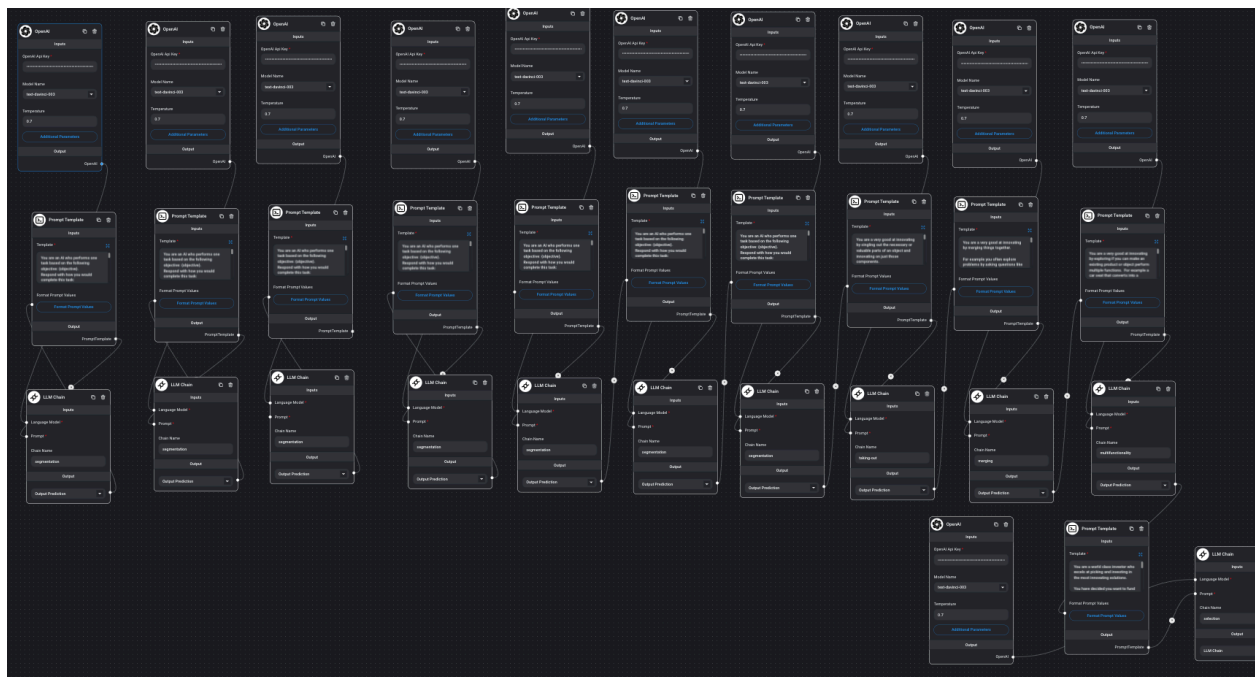


Figure 6: Flowise Visual of Langchain for Prototype of TRIZ Brainstorming System

This example also underscores the necessity for a transition beyond the chatbot interfaces (like ChatGPT) that most people are focused on today. The TRIZ example above, would be better accomplished via a dynamic application-driven interface.

Brainstorming with Proper Integration

In the first two examples, the information being leveraged came from either the entrepreneur or the system developed. However, as discussed in the last section often the value increases when integrated with additional data and systems.

For example, many entrepreneurs spend time regularly reviewing technical journals to understand new capabilities. However, similar to the TRIZ example above it is difficult to do this in a systematic way. GenAI systems that incorporate 3rd party information could change this.

Going back to our initial detailed prompt above, instead of asking the entrepreneur to enter information in the placeholder <startup trends> you could have a LLM that uses APIs to scan, scrape and summarize academic journal text. Then, upon identifying cutting-edge research from these novel sources, could then instigate ideation using whatever method (or methods) were preferred and evaluate the ideas generated. For example, it could compare these ideas through opportunity areas highlighted in a voice of customer (VoC) repository.

Finally, one could even imagine a scenario where a team made the above flow an autonomous agent that conducted this activity regularly and if the idea was above a certain threshold, it could inform an innovation team about potential game-changing ideas to collaboratively refine.

Another early prototype developed in Langchain (see figures below), while not yet an autonomous agent, has shown promising results when exploring certain technical journals such as robotics journals, but similar to the last prototype described, has not yet been systematically tested for efficacy. The image below shows a quick summary of the system:

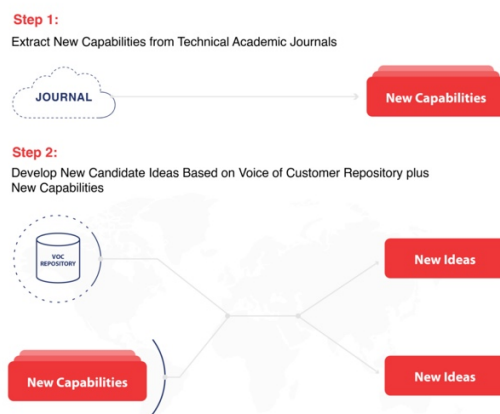


Figure 7: Overview of Academic Journal Scanning System

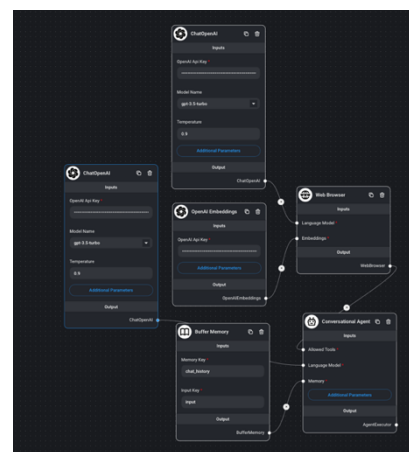


Figure 8: Flowise Visual of Langchain for Prototype Academic Journal Scanning System

Section 5: Conclusion

As we navigate through the current peak of interest in GenAI, it is likely we are still only witnessing the beginning of this wave of innovation. To conclude, the paper will highlight four current challenges of exploration, followed by a brief discussion on what the entire analysis in this paper might mean for the future of entrepreneurship.

Challenge 1: Illusion of Correctness in GenAI

One of the prevalent issues with GenAI systems is the potential for "hallucination" – producing outputs that may seem reasonable but are factually incorrect or do not align with real-world data. While these models have a vast repository of information, their predictions are probabilistic, which can sometimes lead to misleading outputs even if the content is written in a credible way described as "hallucination".^{xlix}

While this paper is focusing on entrepreneurship, the potential for hallucination impacts all knowledge workers leveraging LLMs. An often cited example occurred when two lawyers used ChatGPT to generate and submit a brief which cited six made up cases that never occurred.ⁱ

That said, there are plenty of GenAI Legal Tech solutions built today that ensure lawyers can use their systems without worrying about making similar errors. For example, a team of researchers at Thomson Reuters recently demonstrated how Chain-of-Thought prompts and using established legal frameworks to decompose requests could improve the legal reasoning of GenAI systems.ⁱⁱ Startups, such as CaseText,ⁱⁱⁱ leverage similar techniques plus integrating legal data to create "reliable legal assistants" powered by GenAI.

For entrepreneurs accomplishing tasks that rely on GenAI for factual insights, it will be important those systems leverage similar techniques to those described about in the LegalTech examples above.

Challenge 2: Information Boundaries in GenAI

Another prevalent issues with GenAI systems, especially LLMs, is while their information coverage is vast it does both (1) have a finite knowledge cutoff, meaning the models are unaware of developments or information emerging after their last training data this is typically referred to as the challenge of "knowledge recency" in the research literature and (2) is unaware of information not included in the corpus of training data.

On the finite knowledge cutoff, this limitation poses a risk for entrepreneurs who want to rely on GenAI systems for real-time or recent insights. Without integrating with additional digital tools an entrepreneur could receive outdated or incomplete results. This points back to the importance of proper integration described in section 3.

In terms of corpus of data, different models are trained with different types of content. This obviously impacts the model's approach to problem solving. In this case, not only integrating

additional tools and data, but also providing the model examples through more advanced prompts all can help overcome this challenge.

Challenge 3: Long Term Memory

Most of the GenAI use cases described throughout this paper are not stand-alone activities, but work that needs to be completed with context from prior analysis of the venture. This could be thinking that was done outside of the GenAI system or in prior work done in collaboration with it. Either way, the output and feedback on work created needs to be incorporated into future work.

The appropriate approach to storing and retrieving this information is an area of active research development today.^{liii} Presently, vector databases like Pinecone have emerged as a popular solution^{liv}. By converting information into vectors, these databases promise faster retrieval and improved management.

Vector databases are not a new technology, they have been around for decades.^{lv} However, due to how well they interact with LLMs, they are gaining rapid adoption.^{lvi} While vector databases offer undeniable benefits in scalability and speed, they also pose certain challenges, including data integrity and performance optimization under varied computational loads. Moreover, the diversity of data types and sources that GenAI models have to grapple with necessitates a more nuanced and adaptable data storage and retrieval system.^{lvii} Given these considerations, there is a pressing need to deepen our understanding of the most suitable methods for inputting data into GenAI models.

Challenge 4: Intellectual Property

A final current issue for GenAI has to do with intellectual property ownership. At the time of writing, there is literally a strike in Hollywood with this as one of the most contentious issues to be resolved. In some ways, intellectual property for ventures created leveraging GenAI is even more complex. It's important to point out that this has been debated for literally hundreds of years but the scale GenAI enables this to be done makes it more important than ever.^{lviii}

Beyond intellectual property of the ventures created, earlier this year there were also concerns among many enterprises around ownership of the data entered into the GenAI systems. For example, many leaders were concerned about their employees entering data into ChatGPT which would later be used to train new models. However, this seems to be resolving itself with the release of private enterprise instances from both Microsoft (Azure^{lix}) and more recently OpenAI.^{lx} It remains important to continually monitor as this is a rapidly evolving technology landscape.

Implications for Future of Entrepreneurship

In Section 2, this paper discussed how the startup accelerator model and then codification of this approach via Lean Startup Methodology was catalyzed given the enabling technology at that time. It's important to recognize that sometimes technology is so disruptive it changes the

process of how startups are built. GenAI promises to have this type of impact on the venture creation process.

Beyond everything described in the paper, this also may result in more resilient companies being created moving forward. Over the last decade, legacy companies have spent billions of dollars on “digital transformation” projects. While sometimes these projects feel like excuses for large consulting firms to sell big ticket projects, the reality is that many companies did need to take a more digitally native approach to how they create, organize and capture value.

In the same way that APIs and cloud computing, changed what was possible over the last decade driving the need for this digital transformation, looking forward it will be similarly incumbent on business leaders to ensure legacy organizations are transformed to be AI native.

There is widespread recognition that GenAI will change how business gets done. However, as mentioned in the introduction, most companies are taking a wait and see approach with almost two-thirds not planning on deploying projects for at least a year.^{ix} New ventures that leverage GenAI have the opportunity to start AI native in the same way that new startups like Amazon & Salesforce and corporate startups like SafetyIO were digitally native since founding. While this is not the reason to build ventures with GenAI as a co-founder, it does provide one additional benefit to entrepreneurs adopting this approach.

ⁱ This is consistent with research across professions showing GenAI having greater impact on work that require creative abilities. For more information, please read: [Occupational Heterogeneity in Exposure to Generative AI](#)

ⁱⁱ For more information on the analogy to startup accelerators and mobile / cloud, please see section 2 in the subsection titled “GenAI Impact on Phase 2: Idea Validation”

ⁱⁱⁱ This is often referred to as a “human in the loop” approach to AI. For more information on this approach within GenAI see [“A human in the loop is critical.” McKinsey leaders on generative AI at US media day](#)

^{iv} [\[2209.14958\] Co-Writing Screenplays and Theatre Scripts with Language Models: An Evaluation by Industry Professionals](#)

^v For more information on this broader definition of entrepreneurship, please see the Swartz and Tepper Initiative: Carnegie Mellon’s [Corporate Startup Lab](#)

^{vi} [KPMG Generative AI Survey](#)

^{vii} [Strategy and the Internet](#)

^{viii} [Economic potential of generative AI | McKinsey](#)

^{ix} As two examples of this approach, check out: <https://www.brandcrowd.com/business-name-generator> or <https://ahrefs.com/writing-tools/product-name-generator>

^x See the following link for an explanation of how to do this in Miro: https://help.miro.com/hc/en-us/articles/10339593336210#Using_Miro_AI_with_mind_maps

^{xi} While most of the commercial examples focus on doing competitive intelligence for established products such as <https://www.evaluateserve.com/blog/how-ai-is-changing-competitive-intelligence/> the same approach could be used to support ideation.

^{xii} At the time of this paper’s publication, there are not (to my knowledge) publicly available tools to support this work, but you can see some example prompts that work well directly on ChatGPT here: <https://www.digitalfirst.ai/blog/powerful-chatgpt-prompts-for-start-up#strongactionable-chatgpt-prompt-template-for-ideal-customer-profilestrong>

^{xiii} <https://rubygems.org/>

^{xiv} <https://www.seattletimes.com/business/amazon/in-the-15-years-since-its-launch-amazon-web-services-has-transformed-how-companies-do-business/>

^{xv} See both <https://developer.apple.com/app-store/review/guidelines/> and <https://developers.google.com/workspace/marketplace/about-app-review>

^{xvi} [Accelerating Entrepreneurs and Ecosystems: The Seed Accelerator Model: Innovation Policy and the Economy: Vol 16](#)

^{xvii} For more information on the Lean Startup Methodology, please see: <https://hbr.org/2013/05/why-the-lean-start-up-changes-everything>.

^{xviii} One of the most challenging concepts for new entrepreneurs to grasp is you don't just build one single prototype and either validate or invalidate your idea. While overall the Lean Startup Methodology is great, the introduction of the term "Minimum Viable Product" (MVP) unfortunately sometimes reinforces this misunderstanding with entrepreneurs saying things like "I just need this round of investment to build my MVP." When in fact, more accurately would be "I need to validate these critical assumptions which I'll do through a series of MVPs."

^{xix} As an example of this approach, please see: <https://krock.io/storyboard-ai/>

^{xx} As an example of this approach, please see: <https://makelanding.ai/> or <https://www.mixo.io/> or <https://durable.co/>

^{xxi} As an example, the following plugin integrates ChatGPT to quickly generate wireframes in Figma:

<https://www.figma.com/community/plugin/1221144015267698736/WireGen---AI-GPT-wireframe-generation>

^{xxii} While there are a variety of tools that could be used, it very much depends on which features you are trying to manually simulate. As an example of how this might work in concept, Intercom's integration with ChatGPT provides a nice reference to start entrepreneurs toward brainstorming the appropriate approach:

<https://www.intercom.com/blog/announcing-new-intercom-ai-features/>

^{xxiii} Tools like Github copilot provide a nice example of these capabilities for digital prototypes

<https://github.com/features/copilot>

^{xxiv} These solutions will most likely be integrated into existing CRM solutions. An early example of this is Salesforce's recent release of Einstein GPT for its CRM platform - <https://investor.salesforce.com/press-releases/press-release-details/2023/Salesforce-Announces-Einstein-GPT-the-Worlds-First-Generative-AI-for-CRM/default.aspx>

^{xxv} Sticking with Salesforce as an example, here is an interesting tutorial they just released on how retailers could use GenAI to optimize holiday shopping pricing. <https://www.salesforce.com/blog/retail-pricing-with-ai/> Another example, that to my knowledge is not available commercially but provides an interesting glimpse into the future of financial forecasting is a paper released in June of 2023 [\[2305.01505\] Beyond Classification: Financial Reasoning in State-of-the-Art Language Models](#) that demonstrates LLMs "generate coherent financial reasoning first emerges at 6B parameters, and continues to improve with better instruction-tuning or larger datasets."

^{xxvi} Two examples of early tools being developed to support this work include <https://ia.net/presenter> and <https://tome.app/> While neither is optimized for startup pitch decks, plenty of entrepreneurs have used them for this purpose.

^{xxvii} <https://twitter.com/gdb/status/1599683104142430208>

^{xxviii} [ChatGPT sets record for fastest-growing user base - analyst note | Reuters](#)

^{xxix} [The Brilliance and Weirdness of ChatGPT - The New York Times](#)

^{xxx} [Sam Altman on X: "writing a really great prompt for a chatbot persona is an amazingly high-leverage skill and an early example of programming in a little bit of natural language" / X](#)

^{xxxi} [AI ChatGPT Chatbot Related Prompt Engineer Jobs Pay Up to \\$335,000 - Bloomberg](#)

^{xxxii} [\[2305.11430\] TELeR: A General Taxonomy of LLM Prompts for Benchmarking Complex Tasks](#)

^{xxxiii} **Ibid**

^{xxxiv} [\[2203.04291\] Learning from Few Examples: A Summary of Approaches to Few-Shot Learning](#)

^{xxxv} [\[2005.14165\] Language Models are Few-Shot Learners](#)

^{xxxvi} [\[2201.11903\] Chain-of-Thought Prompting Elicits Reasoning in Large Language Models](#)

^{xxxvii} [GPT-4 Parameters: Unlimited guide NLP's Game-Changer | by Mohammed Lubbad | Medium](#)

^{xxxviii} [\[2201.11903\] Chain-of-Thought Prompting Elicits Reasoning in Large Language Models](#)

^{xxxix} https://python.langchain.com/docs/get_started/introduction.html

^{xl} <https://arxiv.org/abs/2209.14958>

^{xli} <https://openai.com/blog/chatgpt-plugins>

^{xlii} [\[2303.10130\] GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models](#)

^{xliiii} Read the entire analysis here: <https://www.insightpartners.com/ideas/gtm-generative-ai/>

^{xliiv} **Ibid**

^{xliiv} <https://twitter.com/levie/status/1678640484187529216?s=20>

^{xlivi} [What is TRIZ and How can it be used in Problem Solving or Brainstorming? - InnovationManagement](#)

- xlvii <https://www.forbes.com/sites/haydnshaughnessy/2013/03/07/why-is-samsung-such-an-innovative-company/?sh=386cc3ea2ad7>
- xlviii [TRIZ - A Powerful Methodology for Creative Problem Solving](#)
- xlix [\[2303.18223\] A Survey of Large Language Models](#)
- l [New York lawyers sanctioned for using fake ChatGPT cases in legal brief | Reuters](#)
- li [\[2212.01326\] Legal Prompting: Teaching a Language Model to Think Like a Lawyer](#)
- lii <https://casetext.com/>
- liii [\[2303.18223\] A Survey of Large Language Models](#)
- liiv <https://www.pinecone.io/>
- liiv [Vector Database: The Key To Unlocking The Power Of Generative AI](#)
- livi **Ibid**
- liiii [11 known issues of vector-based database used for AI prompting | by Don Lim | Medium](#)
- liiii <https://www.ben-evans.com/benedictevans/2023/8/27/generative-ai-ad-intellectual-property>
- lix [ChatGPT is now available in Azure OpenAI Service | Azure Blog | Microsoft Azure](#)
- lx [Introducing ChatGPT Enterprise](#)
- lxi [KPMG Generative AI Survey](#)