



School of Social Sciences
Master in Business Administration

Postgraduate Dissertation
“AI-enabled Strategic Management”

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Patras, Greece, May 2026

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AI-enabled Strategic Management

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“To my family”

Abstract

While fully automating strategic management using current AI (Large Language Models) is not yet feasible, organizations can significantly accelerate workflows by utilizing advanced prompting techniques. This thesis finds that zero-shot prompting yields lower-quality outputs, whereas Chain-of-Thought and Persona methods provide substantial improvements. Rather than replacing human judgment, AI serves as an accelerator capable of generating the foundational work for the PESTEL and VRIO analyses, and Objectives and Key Results.

To maximize AI's utility, managers must invest upfront in crafting detailed, real-world business cases containing comprehensive financial data, company vision, and historical context. Because AI usage costs are minimal, iterative refinement is highly cost-effective. Ultimately, executives and stakeholders must review, refine, and finalize the AI-generated drafts to formulate the official company strategy.

As AI technology rapidly advances, future research must evaluate new model capabilities as they emerge. Additionally, exploring autonomous agent frameworks, where multiple trained AI agents use advanced prompting to compete and generate optimized strategic outcomes, represents a critical next step for organizational strategy formulation.

Keywords

Strategic management, AI-enablement, PESTEL, VRIO, OKRs

Στρατηγική Διαχείριση με Τεχνητή Νοημοσύνη

Γεώργιος Σφυρής

Περίληψη

Αν και η πλήρη αυτοματοποίηση του στρατηγικού μάνατζμεντ χρησιμοποιώντας την υπάρχουσα Τεχνητή Νοημοσύνη δεν είναι εφικτή, οι εταιρίες μπορούν να επιταχύνουν σημαντικά την διαδικασία χρησιμοποιώντας προχωρημένες τεχνικές prompting. Σε αυτή την εργασία βρίσκουμε ότι το zero-shot prompting δίνει χαμηλής ποιότητας αποτελέσματα, ενώ το Chain-of-Thought και το Persona δίνουν σημαντικά καλύτερα. Αντί να αντικαστήσει την ανθρώπινη λογική η TN δρα σαν καταλύτης ικανός να επιταχύνει την θεμελιώδη δουλειά για τις αναλύσεις PESTEL και VRIO, όπως και για τα Objectives and Key Results. Για να αυξηθεί η αποδοτικότητα της TN, οι μάνατζερς πρέπει να επενδύσουν προκαταβολικά για στην δημιουργία λεπτομερών business cases που να περιέχουν αναλυτικά οικονομικά στοιχεία, το όραμα της εταιρείας, και το ιστορικό της. Επειδή τα κόστη της TN είναι ελάχιστα, η διαδικασία μπορεί να γίνει επαναλαμβανόμενα. Τέλος, τα στελέχη και πρέπει να επιθεωρήσουν και να τελικοποιήσουν τα αποτελέσματα για να γίνουν η επίσημη στρατηγική της εταιρείας.

Επειδή η TN προχωράει πολύ γρήγορα η μελλοντική έρευνα πρέπει να συμπεριλάβει τα νέα μοντέλα. Επιπρόσθετα, πρέπει να εξετάσουν οι αυτόνομοι πράκτορες σε συνδυασμό με προχωρημένο prompting για την δημιουργία εταιρικών στρατηγικών.

Λέξεις – Κλειδιά

Στρατηγικό μάνατζμεντ, Τεχνητή νοημοσύνη, PESTEL, VRIO, OKRs

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List of Abbreviations & Acronyms

ZS	Zero Shot (AI method of prompting)
CoT	Chain of Thought (AI method of prompting)
Persona	Persona (AI method of prompting)
OKR	Objective and Key Result (Goals for companies, KPIs)
PESTEL	Political, Economic, Social, Technological, Environmental, Legal
VRIO	Value, Rarity, Imitability, Organization
NSD	Nova Sphere Dynamics (fictional company)
AKS	Axiom Kinetic Systems (fictional company)
LLM	Large Language Model (AI)
AI	Artificial Intelligence

1. Introduction and Research Foundation

In this chapter, I will examine the foundations of the research proposal, make the problem statement, identify the research questions and objectives, and wrap up the significance of the thesis. The chapter will close with the panel of experts' composition and the software usage for writing the thesis.

1.1 Background: The Generative AI-Strategy

In the last years, there has been a tremendous rise in investment on AI, and more specifically on Large Language Models (LLMs). For example, Amazon recently invested up to \$25bn more in Anthropic (Tolomia, 2026), which has raised \$30bn in their latest round and increased their valuation to \$380bn (Milmo & Wearden, 2026). OpenAI raised \$122bn to accelerate the next phase of AI (OpenAI, 2026). Alphabet (Google) doesn't report the Gemini independently, but as part of Google cloud, which in Q1 of 2026 shows a 63% in Y/Y revenue growth (Alphabet, 2026). In the same report, we see that 16B+ tokens are being used per minute.

Microsoft (Microsoft, 2026) reports that in the first quarter of 2026, AI usage increased by 1,5% from 16.3% to 17,8% of the world's working age population. Gallup data (Gallup, 2026) shows that the proportion of employees using AI daily has increased to 12%. AI/LLMs are now easily accessible from both browsers and phone applications and interact with the users even via voice commands. In 2026, LLMs do multi-step reasoning and autonomous agentic workflows besides simple text generation (Clarifai, 2026). Finally, LLMs improve their performance at each iteration, which is usually in the order of months (Vellum, 2026) and the three key players (ChatGPT, Claude, and Gemini) alternate in the top positions of ranking charts.

1.2 Problem Statement

Strategic management, by definition, is “the art and science of formulating, implementing, and evaluating cross-functional decisions to achieve long-term organizational objectives, involving resource allocation, environmental assessment, and setting goals and policies for competitive advantage” (David & David, 2015). This process is ongoing, mandatory for the company to survive and thrive, and is not straight forward. Information needs to come from many different places, consumed, and analyzed to provide leverage to the company. The LLMs are extremely capable of going through vast quantities of material, and doing analysis based on what they have learned.

In this thesis, I will use three different AI-approaches, namely the “zero-shot (ZS)”, the “Chain-of-Thought (CoT)”, and the “Persona” to conduct PESTEL and VRIO analysis for two fictional companies, the key characteristics of which will be part of the prompt. The AI

will also need to produce Objectives and Key Results (OKRs) for each one of them. Then, those results will be evaluated by a panel of experts with the goal of identifying the most useful, while also gathering industry insights.

1.3 Research Questions

A panel of experts will evaluate the prompt results and offer useful insights. More specifically they will:

1. Evaluate the accuracy and quality of the PESTEL and VRIO analysis
2. Evaluate the accuracy and quality of the respective OKRs
3. Offer insights about AI usage in their organizations now and in the future, to help shape a playbook for strategists.

1.4 Research Objectives & Significance

By answering the research questions above, we assess the 3 AI-approaches in performing PESTEL and VRIO with their respective OKRs and providing a validated playbook for strategists using LLMs. This is not a formal statistic because experts of this kind are very difficult to find.

The rise of LLMs and AI in general has been massive in the last years; the newest problem-solving capabilities are being used into various areas of interest, so the academic literature is hectic for now, but growing at a fast pace. This thesis will not only contribute to academic literature but will also provide a practical prompt guide for strategic managers. Additionally, the whole thesis will provide detailed examples of prompt engineering techniques and their variations so that strategic managers can use what they see fit for their respective areas.

1.5 Panel of Experts composition, and Software/AI usage

The panel of experts, which I must thank profoundly, that contributes by answering the questionnaire consists of (in alphabetical order):

1. [Georgiou Michalis](#), Chief of Staff at Dialectica.
2. [Gounaris Andreas](#), VP of Engineering at Blueground.
3. [Katrini Kostas](#), Senior Manager at HP. Former IBM, Citrix, and Meta.
4. [Ntoulas Alexandros](#), Assistant Professor at UoA. Former Microsoft, Samsung, and LinkedIn.
5. [Petychakis Michael](#), CTO at Dialectica. Former CTO at Orfium.
6. [Vlachogiannis Jon](#), Entrepreneur with 2 exits and angel investor.

All the experts above are working and/or consulting with organizations that do strategic management and formulate OKRs. They all have multiple years of experience and exposure

to various environments ranging from startups to extremely large corporations like Microsoft and Meta.

Software usage: I used Google Forms for the questionnaire, Claude Sonnet 4.6 for the tables and heatmap plots, Google Gemini pro 3.1 for the prompting outputs and language checks. The thesis was written in Word 365. The prompt used to touch up the language of this thesis is as follows: “Act as an expert academic editor specializing in business administration and postgraduate writing. Review the following section of my master's thesis for grammatical precision, structural flow, clarity, and formal academic tone. Apply the following guidelines: 1. Correct all errors in grammar, spelling, punctuation, and syntax. 2. Enhance vocabulary and phrasing to meet a rigorous, high-level academic standard (MSc/MBA level), avoiding colloquialisms or repetitive wording. 3. Ensure the tone is objective, precise, and analytical. 4. Maintain my original meaning, core arguments, and technical data entirely; do not rewrite the underlying concepts. 5. Improve transitions between sentences and paragraphs to ensure smooth logical flow.”

2. Literature Review and Theoretical Framework

In this chapter, I will review the existing literature and develop the theoretical framework for the thesis.

2.1 Foundations of Strategic Analysis

In this thesis, two very fundamental types of Strategic Analysis will be used, namely PESTEL and VRIO analysis. Finally, we will discuss Objectives and Key results.

PESTEL or its variations (Aguilar, 1967) is an acronym for a tool used to identify the external factors that an organization might be facing. The letters stand for Political, Economic, Social, Technological, Environmental, and Legal. Its fundamental use is a full situational analysis, which needs to be repeated (usually every six months) so that possible changes in the macro environment are spotted and addressed.

Political factors determine the extent of government intervention in economies. Tax policies, infrastructure, trade agreements & tariffs, and of course political stability can change the way business is conducted.

Economic factors include the global and local economic situation which impacts the organization and its profitability. Those include inflation, unemployment rates, foreign exchange rates, interest rates, and raw material costs to name the most important ones.

Social factors help the organization understand consumer and broader community needs and wants in a social setting. Those include family demographics, education levels, cultural trends, lifestyle, and attitude changes.

Technological factors refer to AI, automation, research and development, technology incentives, and of course technological advancement in general. They can be barriers or facilitators to enter a market and influence decisions like the outsourcing of materials and services. Changes in technology can impact costs, manufacturing, distribution, and quality.

Environmental factors are very important since corporate social responsibility is taken very seriously. Organizations need to operate while respecting the environment, in a sustainable way. Climate change, government environmental policies and laws, and waste disposal are the key ones to be considered.

Legal factors are overlapping a bit with political factors. The difference is that the organization needs to comply fully and immediately with any legal factor, which also doesn't change so easily. On the other hand, government policies can change, even locally, so the legal factors determine the hard constraints under which an organization operates. Those include health and safety laws, employment laws, and consumer laws.

To conduct a proper PESTEL analysis you need people (that can be assisted by AI as this thesis explores) that have a broad view of the market that will brainstorm and generate the first pass. Then you need a group of experts which might not even be part of the organization, but know the business well, like consumers, suppliers, distributors, and others. All that evidence is gathered, researched, and refined until a proper set of Objectives and Key Results can be determined.

The advantage of PESTEL is the identification of external threats and opportunities that might demand frequent updates (especially for new technology offerings). Businesses sometimes are too self-centered and might miss those external forces that can impact them massively. The disadvantage is that it focuses on the external aspect (it's a very specific tool) and should not be the only tool for strategic management of a company.

VRIO (Barney, 1991) is an acronym for a strategic planning tool used for the evaluation of all the resources and capabilities of a company. The goal is to identify certain resources and capabilities that can provide a sustained competitive advantage. The letters stand for Value, Rarity, Imitability, and Organization.

Valuable is a resource or capability obviously if it brings value to the company or enables it to develop and conduct strategies to improve efficiency and effectiveness, i.e., a competitive advantage.

Rare: a competitive advantage can come only from a resource or capability that is rare or unique among the company's current and potential competitors. The market wants something but can't easily get it, is a good example of rareness.

Imitability is the difficulty that competitors have, in order to obtain or develop that resource or capability.

Organization stands for the ability of the company to exploit that resource or capability. If the management and information systems, logistics, planning, and all parts of the company's structure are set up to exploit this leverage perfectly, then the organization has a competitive advantage.

Usually, to conduct this analysis, we begin with the identification of the assets and capabilities and then answer the questions as they appear on the acronym. If we get a positive response to all of them, we are certain about the competitive advantage. For the ones that get a negative answer, the organization needs to think about the possible next steps and define their Objectives and Key Results.

Objectives and Key Results (Grove, 1983) is a goal-setting framework for individuals, teams, and organizations that is very widely used in software or high-tech companies like Microsoft, LinkedIn, Google, Meta, and many startups. There are two questions to be answered to successfully setup OKRs. First is "where do I want to go?". This answer provides the objective. The second question is "How will I pace myself to see if I am getting there?". This answer provides the milestones, or key results. The OKRs need to be transparent, trackable, and follow the SMART principles: be Specific, Measurable, Achievable, Relevant, and finally Time-bound.

2.2 Theoretical Foundations of LLM Prompting

There are three key approaches I will be using for this thesis: ZS, CoT, and Persona, which will be analyzed in detail below.

Zero-Shot (ZS) (Palatucci et al, 2009) refers to the model's ability to perform a task or make predictions without having seen any specific training examples for that task. Zero-shot capability is one of the key advantages of large language models like GPT, Claude, and others, enabling them to be versatile "generalist" systems. It is the quick and easy approach that most people use to interact with an LLM: they just ask a question. Of course, when the question or analysis becomes more complex, the user needs to provide more input so that the answers are practical.

Chain-of-Thought (CoT) (Wei et al, 2022) prompting encourages AI models to break down complex problems into intermediate reasoning steps rather than jumping directly to an answer. Instead of just providing a final output, the model explicitly shows its "thinking process." CoT has become a standard technique for getting better performance from LLMs on challenging tasks.

Persona refers to the character, personality, style, or role that an AI system adopts when interacting with users. It has emerged in the field since the beginning of LLM prompting,

and researchers are using it (Schreiber et al, 2025). By using a persona, the output has a specific tone, which in our case will be professional. The communication style can also vary with options being more concise or verbose, technical or accessible, and more. Finally, depending on the role/persona selected, the knowledge of presentation is different.

Personas matter for several important reasons. They significantly improve the user experience by making interactions feel more natural and appropriate for the specific context. Different personas also prove more effective for different tasks—for instance, an empathetic tone works better for customer support situations, while a more authoritative voice is preferable when delivering medical information. From a business perspective, personas allow companies to create AI systems that genuinely reflect their brand values and voice. Perhaps most importantly, maintaining a consistent persona helps build trust with users, as they come to understand what they can expect from their interactions with the AI.

2.3 AI in Strategic Management

In his review article, Keding (Keding, 2021) presents a systematic literature review of forty years of research (1979-2019) on the role of artificial intelligence (AI) in strategic management.

The author has identified several challenges in his review:

1. **Disciplinary fragmentation:** the literature is highly fragmented at the intersection of information systems, management, and organizational studies, leading to an unbalanced evolution of the research field.
2. **Lack of structural cohesion:** due to its multidisciplinary nature the research lacks a coherent structure and suffers from inconsistent terminology.
3. **Historical ignorance:** because of recurring periods without significant AI research (the so-called AI winters), some current debate, such as machines substituting humans, are discussed as if they are entirely new, ignoring previous scholarship.
4. **Lack of Empirical and Theoretical Grounding:** Much of the existing literature is conceptual rather than empirical. There is also a distinct lack of theoretically grounded research that aims to understand the utility of the latest generation of AI.

Considering that in the years after the publication of this paper there has been an explosion in AI usage and funding, as seen in previous sections of this work, one can understand that all those challenges are pretty much relative today.

In the article, the following conditions for leveraging AI are identified

1. **Data-driven workflows:** Requires an effective data value chain and high-quality data to convert unstructured information into actionable strategic insights.

2. **Managerial willingness:** Depends on organizational support, the dismantling of vertical information silos, and the workforce's trust and acceptance of algorithmic decisions.
3. **Organizational determinants:** Necessitates a distinct, customized AI strategy and a measured method of implementation, rather than treating AI as a simple plug-and-play tool.

All the challenges above are valid even today: organizations need processes and mentality shifts to be able to create and maintain high-quality data. They also need to work with other organizations to acquire high-quality data for external analysis, like PESTEL. This requires change management and even the monetary cost could be high. As with every other transformation, the structural changes in an organization due to AI are slow and met with resistance. Finally, the AI strategy, i.e., which data and at which detail the organization is trying to acquire, the training of AI systems on that data, and the evaluation of the results are extremely difficult since there is no plug-and-play solution. Of course, this will be a differentiating factor, that might create a competitive advantage for companies, and this is why many companies jump on the AI trend even without a solid strategy (they are trying to learn as they go) in a fear of missing out.

The conclusions of the article are:

1. Individual Level: AI impacts managerial cognition by helping process data overloads, which subsequently increases the value of complementary human skills like judgment, intuition, and empathy that algorithms lack.
2. Organizational Level: AI reshapes human-machine collaboration (favoring augmentation over substitution), redesigns decision-making governance (e.g., automated versus aggregated decision-making), enhances agility in strategy development, and embeds predictive logic directly into new business models.
3. The review concludes that while algorithms can outperform humans in specific, objective tasks, a complete substitution of human managers is unlikely. The true strategic value of AI is realized through an augmented human-machine symbiosis, where organizations effectively align their resources, build workforce trust, and rely on human managers for sense-making and overarching strategic judgment.

3. Research Methodology and Experimental Design

In this chapter, I elaborate on the research methodology and experimental design. Since this work focuses on using AI for Strategic Management, extensive parts of this chapter will be the outcome of AI use.

3.1 Research Design

The research design is as follows: I have created two case studies, for two fictional companies named Nova Sphere Dynamics (NSD) and Axiom Kinetic Designs (AKS) respectively. The two case studies describe the fundamentals of each company, the challenges they face, and their desired outcomes, which fall under strategic management. Then I will use the “zero-shot (ZS)”, the “Chain-of-Thought (CoT)”, and the “Persona” to conduct PESTEL and VRIO. The AI will also need to produce Objectives and Key Results (OKRs) for each one of them. I have also created an app on Google AI Studio, that is able to count the tokens used for each one of the prompts. What I found out is that the number of tokens spent (which means the cost) was low and almost identical for all the prompts. This finding removes the cost constraint from running the prompts again in the future, PESTEL, VRIO and OKRs need to change with time.

3.2 Case study input: Nova Sphere Dynamics (NSD)

The text below is the case study input for Nova Sphere Dynamics (NSD) and will be used as is in all the prompts for PESTEL analysis to provide context.

“Nova Sphere Dynamics is a high-growth Urban Air Mobility (UAM) and logistics company poised to launch its flagship service, the '**SkyLink**' network. This proprietary network consists of a fleet of fully autonomous drones designed for the last-mile delivery of high-value, time-sensitive goods (e.g., pharmaceuticals, critical medical supplies, and specialized manufacturing parts) within congested metropolitan areas.

Industry Context: The UAM logistics market is nascent and characterized by extreme uncertainty. Success is contingent not only on technology but on securing regulatory approval and public trust. Nova Sphere's technology is market-leading, having successfully completed all technical proof-of-concept and safety trials in controlled environments.

Corporate Goal: The primary strategic objective for the next 36 months is to achieve a successful commercial launch and establish a scalable, compliant, and publicly accepted network in three key metropolitan markets around the world. The financial target is to achieve a \$50 million revenue run rate within this 3-year period.

Core Challenge: NSD is moving from a controlled R&D environment to real-world commercial deployment in three targeted cities around the world simultaneously. Our success hinges not on the technology, which is market-leading, but on navigating the complex external forces that govern the skyways and public perception. The company faces a fragmented and rapidly evolving regulatory landscape, with disparate rules at the national, state, and municipal levels (Political/Legal). Furthermore, there is significant public apprehension regarding safety (risk of falling drones), privacy (onboard cameras for

navigation), and noise pollution (Social), which could lead to immediate, restrictive backlash and operational bans.

Key External Factors for Consideration:

- **Political & Legal:** A patchwork of conflicting aviation regulations (e.g., FAA in the US, EASA in the EU) and a lack of specific municipal laws for low-altitude autonomous vehicles.
- **Economic:** High operational costs (e.g., battery materials, insurance) in an inflationary environment, juxtaposed with intense price pressure from established ground-based logistics giants.
- **Social:** Public perception is highly volatile and heavily influenced by media reports of any single incident. Concerns over noise, privacy, and safety in residential zones are paramount.
- **Technological:** Rapid advancements in competing ground-based autonomous delivery robots and the development of sophisticated anti-drone security measures by third parties.

The Scenario Requiring PESTEL Analysis:

We require a rigorous **PESTEL Analysis** as the foundational step for our three-year market-entry strategy. Specifically, we need to understand:

1. **Political & Legal:** The patchwork of national and municipal air traffic control (ATC) regulations for low-altitude autonomous vehicles. The risk of sudden, restrictive legislation following a public incident.
2. **Economic:** The current inflationary environment impacting operational costs (e.g., battery materials), juxtaposed with the competitive price pressure from traditional logistics giants.
3. **Social:** The level of public acceptance concerning noise pollution, privacy (onboard cameras), and the safety of autonomous vehicles flying over residential zones.
4. **Technological:** The pace of development in anti-drone security measures and competing ground-based autonomous delivery technologies.

Deliverables Needed:

The analysis must not only describe these factors but also provide a clear set of strategic implications. Following this, we need the associated **Objectives and Key Results (OKRs)** for our next fiscal year, focused entirely on mitigating the highest-risk PESTEL factors identified.”

3.3 Case study input: Axiom Kinetic Systems (AKS)

The text below is the case study input for Axiom Kinetic Systems (AKS) and will be used as is in all the prompts for VRIO analysis to provide context.

“Axiom Kinetic Systems (AKS) operates in the highly specialized field of **Industrial Engineering and High-Fidelity Acoustic Signature Suppression**. We are a niche, premium-priced firm whose primary clients are elite defense contractors, deep-sea exploration organizations, and specialized aerospace companies requiring mission-critical stealth capabilities. Our success is exclusively defined by the verifiable **absence of measurable sound or vibration signatures** in the complex platforms we enhance. We do not build platforms (like submarines, satellites, or deep-sea robotic explorers); we are brought in by the prime contractors (e.g., defense giants, national research labs) to engineer the systems that make their platforms undetectable. Our solutions eliminate acoustic, thermal, and vibration signatures. Our company's motto is "We Prove the Absence." The stakes are absolute: if one of our systems fails, a multi-billion-dollar satellite mission is compromised, or a strategic defense asset is detected. There is zero margin for error.

Industry Context: The market is characterized by extremely high barriers to entry due to stringent regulatory compliance and the requirement for deep, decades-long institutional trust. However, the competitive landscape is shifting; research institutions are beginning to license sophisticated, yet still inferior, competitive solutions, threatening AKS's premium pricing structure and its 15-year sole-source contracts which are now entering a competitive re-bidding cycle.

Corporate Goal: To successfully defend all key sole-source contracts in the next three years and secure a dominant position in the emerging deep-sea robotics market. To achieve this, AKS must rigorously define, protect, and invest in its **Sustainable Competitive Advantage**.

Core Challenge: To move beyond past reputation and precisely identify which internal assets or capabilities offer superior, long-term, and non-replicable value that justifies continued market leadership. The competitive landscape is now shifting for the first time in 20 years. Our 15-year sole-source contracts are coming up for re-bidding. The threat is not from established peers (there are none) but from two new sources:

1. **University Spin-offs:** Well-funded research labs are commercializing AI-driven simulation tools that *claim* to model complex physics, offering a 'good enough' solution at a fraction of our cost.
2. **Internal R&D:** Our own prime contractors, seeking to cut costs, are attempting to build in-house teams to replicate our results.

Our core challenge is that we have relied on our "black box" reputation for so long, we are not certain which of our internal capabilities is the *true* source of our sustained competitive

advantage. We must identify, define, and protect it, or risk being commoditized by AI-driven COTS solutions.

Key Internal Assets Under Consideration:

1. **The "Axiom Modeling Suite" (AMS):** This is our proprietary, in-house developed software suite. It was built over 15 years by our physics and material science teams. Its core strength lies in its unique ability to model **non-linear, multi-vector interactions**—specifically, how crystalline material stress fractures and non-Newtonian fluid dynamics behave at micro-vibration levels. Commercial Off-the-Shelf (COTS) software like Ansys or SolidWorks can model linear, isolated physics, but they fail to predict the chaotic, combined-effects environment of a real-world deployment. The AMS has a verified 99.99% predictive accuracy against our real-world field data.
2. **The "Silent Hand" Technician Team:** This is our 12-member, cross-disciplinary "Special Projects" team. They are all senior engineers and PhDs with an average tenure of 18 years at AKS. This team possesses the critical **tacit knowledge** for *post-installation, field-level calibration*. The AMS can model the system, but this team has the non-replicable, intuitive "feel" for how a physical system behaves under real-world pressure. They manually tune and calibrate our dampening systems on-site, a process that relies on sensory feedback (sound, feel, temperature) that cannot be documented or automated. This skill is only developed through a mandatory 5-year, 50-deployment internal apprenticeship.
3. **Exclusive Supplier Agreements (Neodymium Composite):** A decade ago, our founder secured a 25-year exclusive supply and development agreement with a single, family-owned processor in Southeast Asia. This agreement is for a specific, non-standard **neodymium-iron-boron composite** (a rare-earth magnetic material) that is the core component of our proprietary vibration dampeners. Since this agreement was signed *before* the material was classified as a critical strategic resource and before subsequent geopolitical trade wars, the price-per-kilogram and supply guarantees in our contract are **impossible to replicate today**. Competitors must use inferior (or vastly more expensive) alternative materials, which limits their performance.

The Scenario Requiring VRIO Analysis:

We require a rigorous VRIO Analysis to evaluate the sustainability of our competitive advantages as we scale our operations. Specifically, we need to assess our core internal assets:

- Value: Does the Axiom Modeling Suite (AMS) provide a unique capability to mitigate chaotic, non-linear environmental risks that standard COTS software cannot predict?
- Rarity: How unique is the "Silent Hand" Technician Team's tacit knowledge and apprenticeship-based calibration skill within the current engineering labor market?
- Imitability: To what extent do our Exclusive Supplier Agreements for neodymium composites create a cost and performance barrier that competitors cannot replicate due to current geopolitical and economic shifts?
- Organization: Is AKS currently structured to fully capture the value of these specialized assets, ensuring the "Silent Hand" team's insights are integrated into the AMS's ongoing development?

Deliverables Needed:

The analysis must categorize each asset as a competitive disadvantage, parity, temporary advantage, or sustained competitive advantage. Following this, we need the associated Objectives and Key Results (OKRs) for the next fiscal year, focused on institutionalizing the "Silent Hand" apprenticeship program and legally fortifying our exclusive material supply chain to prevent any erosion of our market position.”

3.4 PESTEL with OKRs Prompt Engineering Protocols

The PESTEL case study for NSD is augmented with the following three prompts, for each AI approach:

PROMPT 1: Zero-Shot PESTEL & OKRs

“Perform a comprehensive PESTEL analysis for the company, Nova Sphere Dynamics (NSD), based on the case study provided. For each of the six PESTEL factors, provide at least one major finding and a brief implication. Following the analysis, use the findings to draft three measurable Annual Objectives and Key Results (OKRs) for the company's CEO to guide their market-entry strategy. Format the output in three distinct sections: PESTEL findings, Strategic Implications, and Annual OKRs.”

PROMPT 2: Chain-of-Thought (CoT) PESTEL & OKRs

“You are tasked with conducting a PESTEL strategic analysis for Nova Sphere Dynamics’ SkyLink launch. Step 1 (Analysis): Systematically analyze the case summary, first detailing the Political, Economic, and Social factors, explaining their interdependencies. Then, analyze the Technological, Environmental, and Legal factors. Step 2 (Synthesis): Identify the single high-risk factor and the single highest-opportunity factor from your full PESTEL analysis, while keeping the rest brief. Explain the core strategic challenge this combination presents to the CEO. Step 3 (Action): Using your synthesized challenge, draft three high-quality, measurable Annual Objectives and Key Results (OKRs) that directly address mitigating the risk and exploiting the opportunity. Present your output by first showing your step-by-step reasoning (Steps 1 and 2), followed by the final OKRs (Step 3).”

PROMPT 3: Persona PESTEL & OKRs

"You are the **Chief Strategy Officer (CSO)** of a leading Global Aviation Consultancy, hired by Nova Sphere Dynamics. Your mandate is to rapidly assess the external environment for their critical 'SkyLink' network launch.

Task:

1. **PESTEL Assessment:** Execute a PESTEL analysis, framing your findings not as academic points, but as **Immediate Strategic Directives** for the CEO. Focus particularly on regulatory barriers and public sentiment.
2. **OKR Formulation:** Based on these high-priority directives, generate three annual **Tier 1 Strategic Objectives** with two corresponding **Key Results** each. Ensure the Objectives are aspirational, and the Key Results are S.M.A.R.T. (Specific, Measurable, Achievable, Relevant, Time-bound).

Your final output must be in the format of a **CSO Executive Briefing**, strictly using clear, decisive business language."

3.4 VRIO with OKRs Prompt Engineering Protocols

The VRIO case study for AKS is augmented with the following three prompts, for each AI approach:

PROMPT 1: Zero-Shot VRIO & OKRs

“Analyze the three key internal assets of Axiom Kinetic Systems (AKS): the Axiom Modeling Suite (AMS), the Silent Hand Technician Team, and the Exclusive Supplier Agreements. Apply the full VRIO framework (Valuable, Rare, Imitable, Organized to Exploit) to each asset. Conclude which asset provides a **Sustained Competitive Advantage**. Finally, draft three high-quality Annual Objectives and two Key Results for each one, specifically designed to protect and maximize the leverage of that single Sustained Competitive Advantage asset. Present the analysis in a VRIO summary table and the OKRs in a standard list format.”

PROMPT 2: Chain-of-Thought (CoT) VRIO & OKRs

“Step 1 (Assessment Logic): For each of the three assets (AMS, Silent Hand Team, Supplier Agreements), first determine its Value. Then articulate the specific reasoning for your Rareness score, focusing on market availability. Next, provide a detailed rationale for your Inimitability assessment, considering both direct duplication and substitution. Finally, evaluate the organization’s readiness to Exploit the resource. Step 2 (Conclusion Synthesis): Based explicitly on the sequential VRIO ratings from Step 1, identify and state the single asset that meets all four criteria (V, R, I, O) and therefore provides a Sustained Competitive Advantage. Explain the implications if the other two assets were merely rated ‘Temporary Advantage’ or ‘Competitive Parity’. Step 3 (Action Planning): Draft three measurable Annual Objectives with two Key Results each (OKRs) that directly prioritize protecting the non-imitable element and scaling the rare element of the Sustained Competitive Advantage identified in Step 2. Provide your output by presenting your Step 1 and Step 2 reasoning before the final OKRs (Step 3).”

PROMPT 3: Persona VRIO & OKRs

"You are the **Lead Partner of Competitive Strategy Practice** at a high-end consultancy firm, reporting directly to the AKS CEO. Your brief is to identify AKS’s **unassailable core resource** and formulate a bulletproof plan to capitalize on it.

Tasks:

1. **VRIO Analysis:** Conduct a rapid but rigorous VRIO assessment of the three critical assets. Do not use a simple table; instead, frame the analysis as an **Executive Summary** that isolates and justifies the *one* resource that provides a **Sustained Competitive Advantage**. Your justification must use decisive language suitable for immediate C-suite presentation.
2. **OKR Directive:** Based *only* on the Sustained Competitive Advantage resource identified, generate three **High-Aspiration Strategic Objectives** with Key Results (OKRs). The Objectives must be focused on **monetization, institutionalization,**

and defense of that resource against all forms of substitution or imitation. Ensure the Objectives are aspirational, and the Key Results are S.M.A.R.T. (Specific, Measurable, Achievable, Relevant, Time-bound).

Your final output must be structured as an urgent **Partner Memo to the CEO**, using concise, action-oriented, and high-level strategy vocabulary.”

3.5 Questionnaire

The questionnaire presented to the panel of experts consists of ten questions, designed to get both measurable arithmetic feedback, and open-ended questions that will provide deeper understanding and elaboration. The high-level structure is as follows: Likert questions for PESTEL/VRIO/OKRs, followed by opened ended questions for the strengths and weaknesses of each method. The last two questions are also open-ended: they discuss the performance of ZS/CoT/Persona in the two scenarios and then discuss the actual AI usage. The detailed questionnaire with explanations is provided below. The reviewers actually completed an online form, for easier collection of the data.

Question 1: Please evaluate the PESTEL analysis of each method

In this question, the reviewers are asked to pick a value from a Likert scale regarding their satisfaction with the PESTEL analysis of the three models, i.e. ZS, CoT, and Persona. The Likert scale is:

1. Unacceptable analysis
2. Poor analysis
3. Junior analysis, needs serious review by an expert
4. Mid level analysis, still requires some review
5. Expert level analysis, that would accelerate or replace my work

And will be used for all the other questions that contain a Likert scale.

Question 2: In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the PESTEL analysis?

In this question, the reviewers are asked to answer an open-ended question and provide their expertise on the output of the AI, regarding the PESTEL analysis.

Question 3: Please evaluate the OKRs analysis of each method

In this question, the reviewers are asked to pick a value from a Likert scale regarding their satisfaction with the OKR analysis of the three models, i.e. ZS, CoT, and Persona.

Question 4: In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the OKRs analysis?

In this question, the reviewers are asked to answer an open-ended question and provide their expertise on the output of the AI, regarding the OKR analysis.

Question 5: Please evaluate the VRIO analysis of each method

In this question, the reviewers are asked to pick a value from a Likert scale regarding their satisfaction with the VRIO analysis of the three models, i.e. ZS, CoT, and Persona.

Question 6: In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the VRIO analysis?

In this question, the reviewers are asked to answer an open-ended question and provide their expertise on the output of the AI, regarding the PESTEL analysis.

Question 7: Please evaluate the OKRs analysis of each method

In this question, the reviewers are asked to pick a value from a Likert scale regarding their satisfaction with the OKR analysis of the three models, i.e. ZS, CoT, and Persona.

Question 8: In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the OKRs analysis?

In this question, the reviewers are asked to answer an open-ended question and provide their expertise on the output of the AI, regarding the OKR analysis

Question 9: Across both case studies, did the same prompting approach consistently perform best, or did the strongest approach differ depending on the framework being applied? What might explain that?

This is an open-ended question to cross-evaluate the methods in the different analysis, followed by an ask for a possible explanation of the possible discrepancies.

Question 10: In your expert opinion, after seeing both PESTEL and VRIO analysis with their relevant OKRs, how would you use AI for strategic management in your actual work/organization? How would you improve the existing approach even further?

The final question is also an open-ended one: the reviewers are asked about their actual AI usage and possible improvements.

4. Results, Quantitative and Qualitative Analysis

In this chapter, I will present the prompting outputs exactly as they were produced, and the quantitative and qualitative results of the questionnaire the experts answered. The quantitative data will come from the Likert scale questions, while the qualitative data will come from the open-ended questions.

4.1 Prompting Outputs for PESTEL Analysis for NSD company

Zero-Shot PESTEL and OKRs Output

Factor followed by Major Finding

Political - Regulatory Fragmentation: Inconsistent standards between national bodies (FAA/EASA) and local municipal authorities regarding low-altitude airspace.

Economic - Cost-Price Squeeze: Inflationary pressure on battery materials and insurance premiums vs. aggressive pricing from established ground-based logistics.

Social - Public Volatility: Significant apprehension regarding noise pollution and privacy (cameras), where a single incident could trigger widespread bans.

Technological - Competitive Convergence: Rapid advancement in anti-drone security measures and rival ground-based autonomous delivery robots.

Environmental - Acoustic Footprint: Increasing urban "quiet zone" mandates that categorize drone propulsion as a pollutant.

Legal - Liability Ambiguity: Lack of clear legal frameworks for autonomous vehicle liability and data privacy in residential "over-flight" zones.

Strategic Implications

- **Localized Compliance Strategy:** NSD cannot rely on a "one-size-fits-all" approach. A dedicated regulatory affairs team must be embedded in each target municipality to navigate the specific local-national legislative gaps.
- **Premium Value Proposition:** To counter high operational costs and ground-based competition, NSD must focus exclusively on high-margin, time-critical sectors (e.g., organ transport or high-tech parts) where speed justifies the price premium.
- **Social License to Operate:** Public acceptance is the ultimate gatekeeper. Strategic success depends on "quiet-by-design" technology and transparent data-handling protocols to preempt privacy concerns and "NIMBY" (Not In My Backyard) sentiment.
- **Defensive Engineering:** Development must include robust "detect and avoid" tech and encryption to bypass third-party anti-drone measures and ensure safety in high-density areas.

Annual OKRs

Objective 1: Establish Regulatory and Legal Foundations for Global Launch

- **KR 1:** Secure formal "Permit to Operate" or "Special Flight Operations Certificate" in at least 2 of the 3 target metropolitan markets.

- **KR 2:** Achieve FAA and EASA "Type Certification" for the SkyLink drone fleet.
- **KR 3:** Execute three "Community Impact" pilot programs with zero reported noise or privacy violations.

Objective 2: Optimize Economic Viability and Operational Efficiency

- **KR 1:** Reduce cost-per-delivery by 15% through the implementation of second-generation high-density battery arrays.
- **KR 2:** Secure binding Letters of Intent (LOIs) from five Tier-1 pharmaceutical or medical suppliers to guarantee initial volume.
- **KR 3:** Negotiate a multi-regional insurance partnership that caps liability premiums at 10% of total OpEx.

Objective 3: Build Public Trust and Social Acceptance

- **KR 1:** Achieve a 70% positive public sentiment score in target city pre-launch surveys via a transparent "Privacy First" data-erasure campaign.
- **KR 2:** Demonstrate a 20% reduction in decibel levels compared to industry-standard delivery drones in independent noise audits.
- **KR 3:** Complete 1,000 incident-free autonomous hours in mixed-use residential corridors during final-stage testing.

Chain-of-Thought PESTEL and OKRs Output

Step 1: PESTEL Analysis & Interdependencies

To successfully launch the SkyLink network, we must look beyond the flight path and examine the friction points on the ground.

Political, Economic, and Social Factors

- **Political:** The primary hurdle is **regulatory fragmentation**. While national bodies (FAA, EASA) set broad airworthiness standards, municipal governments hold the power to restrict local takeoff/landing zones.
- **Economic:** We are operating in a "Margin Squeeze." High **OPEX** (battery materials, specialized insurance) is meeting a downward pressure on pricing from ground-based giants (Amazon, UPS) who benefit from massive economies of scale.
- **Social:** The "**NIMBY**" (**Not In My Backyard**) factor. Public perception is the most volatile variable; concerns over noise and privacy aren't just complaints—they are catalysts for political action.
- **Interdependencies:** These three are a feedback loop. A single **Social** incident (a noisy drone over a park) triggers **Political** pressure, which leads to restrictive **Legal** bans, ultimately destroying the **Economic** viability of a specific city market.

Technological, Environmental, and Legal Factors

- **Technological:** While NSD's tech is leading, the rise of **anti-drone security** (signal jamming by private entities) and the rapid evolution of ground-based autonomous delivery robots present a "flanking" competitive threat.
- **Environmental:** This is a double-edged sword. While drones reduce carbon footprints compared to vans, **noise pollution** is classified as an environmental hazard that can lead to strict decibel-level caps in urban centers.
- **Legal:** Beyond aviation law, **Data Privacy** (GDPR/CCPA) is a major landmine. Onboard navigation cameras inadvertently capturing private property could lead to massive class-action litigation.

Step 2: Synthesis of Strategic Challenge

- **Highest-Risk Factor: Social-Regulatory Whiplash.**

The risk isn't just a technical failure; it's a "one-and-done" scenario where a single safety or privacy lapse causes a cascade of municipal bans, effectively locking NSD out of key markets before the 36-month goal is reached.

- **Highest-Opportunity Factor: First-Mover "Critical Path" Dominance.**

By focusing on high-value, time-sensitive goods (pharmaceuticals), NSD can position itself as a **lifesaving utility** rather than a "delivery nuisance," making it politically "too important to ban."

The CEO's Core Strategic Challenge:

You must balance **Operational Speed** with **Social Friction**. Your challenge is to transform SkyLink from a "disruptive technology" into a "trusted public utility" before a single negative incident or a ground-based competitor defines the narrative for you.

Step 3: Annual OKRs (Fiscal Year 1)

Objective 1: Achieve "Social License to Operate" through Transparency and Safety.

- **KR 1:** Maintain a 0% critical safety incident rate across all 3 pilot metropolitan zones.
- **KR 2:** Secure formal "Community Approval" or "No Objection" MOU from at least 70% of municipal councils in target launch zones.
- **KR 3:** Reduce average drone acoustic signature to below 60 dB at a 50ft altitude, verified by independent third-party audits.

Objective 2: Build a Compliant and Resilient Regulatory Moat.

- **KR 1:** Obtain Part 135 (or EASA equivalent) commercial drone operator certification in at least 2 of the 3 target global markets.

- **KR 2:** Implement a proprietary "Privacy-by-Design" firmware that auto-blurs all non-navigational human faces/windows in real-time, passing a GDPR/privacy compliance audit.
- **KR 3:** Establish a "Regulatory Rapid Response" task force capable of engaging municipal legislators within 24 hours of any proposed restrictive drone ordinance.

Objective 3: Validate Economic Viability in High-Value Segments.

- **KR 1:** Secure 3 anchor "Critical-Logistics" contracts (e.g., Hospital networks or specialized manufacturing) with a combined projected annual contract value (ACV) of \$10M.
- **KR 2:** Reduce per-delivery battery degradation costs by 15% through a new energy management partnership or technical optimization.
- **KR 3:** Achieve an "On-Time Delivery" (OTD) rate of 99.5% for all medical-grade transport missions.

Do you have a specific metropolitan market in mind—such as Athens or London—where you'd like to see these PESTEL factors applied to local regulations?

Persona PESTEL and OKRs Output

To: CEO, Nova Sphere Dynamics

From: Chief Strategy Officer, [Consultancy Name]

Date: May 8, 2026

Subject: Strategic Environment Assessment & FY1 Execution Framework – SkyLink Network

Executive Summary

Nova Sphere Dynamics (NSD) stands at a critical juncture. While the 'SkyLink' technology is flight-ready, the external environment presents significant non-technical barriers. Success in the next 36 months requires transitioning from a "Technology-First" to a "Regulatory and Social-First" posture. The following briefing outlines the PESTEL-derived directives and the operational framework for the upcoming fiscal year.

PESTEL Strategic Directives1. Political & Legal: Regulatory Synchronization

Directive: Pivot from Compliance to Advocacy.

The current patchwork of FAA, EASA, and municipal frameworks is the primary threat to scalability. NSD must move beyond adhering to existing rules and actively lead the development of "low-altitude corridors."

- **Risk:** Sudden municipal bans following a single safety or noise incident.

- **Action:** Establish a "Regulatory Sandbox" initiative in each of the three target cities to co-create traffic management protocols with local authorities.

2. Economic: Niche-Premium Positioning

Directive: Abandon the Volume War; Win the Criticality War.

Inflationary pressure on battery materials and insurance premiums makes competing with ground-based giants on price a losing strategy.

- **Risk:** Margin erosion from price-matching traditional logistics.
- **Action:** Secure long-term, fixed-price contracts with pharmaceutical and specialized manufacturing leaders. Position SkyLink as a high-margin "Criticality-as-a-Service" rather than a general delivery utility.

3. Social: The "Social License" to Operate

Directive: Radical Transparency in Public Relations.

Technical safety is irrelevant if public perception is dominated by "privacy paranoia" and noise complaints.

- **Risk:** Grassroots movements and "NIMBY" (Not In My Back Yard) legislation.
- **Action:** Deploy a "Community First" dashboard that provides real-time, anonymized data on flight purpose and safety metrics to residents in flight paths.

4. Technological: Counter-Measure Hardening

Directive: Secure the Skies Against Third-Party Interference.

As autonomous delivery scales, the threat of anti-drone technology and "signal hijacking" by malicious actors increases.

- **Risk:** Operational shutdowns due to electronic interference or competitive ground-robot encroachment.
- **Action:** Accelerate the integration of frequency-hopping spread spectrum (FHSS) and LiDAR-based "see-and-avoid" systems that function independently of GPS.

5. Environmental: Sustainability as a Competitive Moat

Directive: Lifecycle Accountability.

With increasing scrutiny on battery disposal and noise pollution, NSD must lead the ESG (Environmental, Social, and Governance) conversation.

- **Action:** Implement a closed-loop battery recycling program and publish decibel-verified noise maps for every route.

FY1 Strategic OKRs

The following OKRs are designed to mitigate the highest-priority PESTEL risks while building the foundation for the \$50 million revenue run rate.

Objective 1: Secure "Pioneer Status" via Regulatory Breakthroughs

Goal: Shift from experimental to permanent commercial flight status in at least two jurisdictions.

- **KR 1:** Secure "Beyond Visual Line of Sight" (BVLOS) permanent certification in 2 of the 3 target metropolitan markets by Q4.
- **KR 2:** Establish a formal Public-Private Partnership (PPP) for low-altitude air traffic management with at least one municipal government by Q3.

Objective 2: Establish the "Trust Baseline" with Local Communities

Goal: Neutralize social backlash through proactive engagement and transparency.

- **KR 3:** Achieve a >70% public "Acceptability Rating" in residential pilot zones, as measured by independent quarterly sentiment surveys.
- **KR 4:** Maintain zero (0) privacy-related litigation or formal municipal noise complaints through the implementation of "Privacy-by-Design" (on-board data blurring) protocols.

Objective 3: Validate High-Margin Unit Economics

Goal: Demonstrate the financial viability of the premium delivery model despite inflationary headwinds.

- **KR 5:** Onboard 5 Tier-1 pharmaceutical or medical partners with multi-year service level agreements (SLAs) totaling a \$10 million projected annual contract value (ACV).
- **KR 6:** Reduce per-delivery insurance premiums by 15% through the submission of 10,000 hours of incident-free flight data to underwriters.

Final Assessment

The technology is ready; the world is not. The next 12 months must focus on building the "invisible infrastructure" of laws, trust, and premium partnerships. Without these, the SkyLink network will remain grounded by bureaucracy regardless of its technical superiority.

Strategic Lead, [Consultancy Name]

4.2 Prompting Outputs for VRIO Analysis for AKS company

Zero-Shot VRIO and OKRs Output

VRIO Analysis Summary

Internal Asset | Valuable | Rare | Inimitable | Organized to Exploit | Competitive Implication

Axiom Modeling Suite (AMS) | Yes | Yes | No | Yes | Temporary Competitive Advantage

"Silent Hand" Technician Team | Yes | Yes | Yes | Yes | Sustained Competitive Advantage

Exclusive Supplier Agreements | Yes | Yes | Yes | Yes | Sustained Competitive Advantage

Asset Analysis & Conclusion

1. Axiom Modeling Suite (AMS)

- **Analysis:** The AMS is highly valuable (99.99% predictive accuracy) and currently rare. However, it is increasingly imitable. Well-funded university spin-offs using AI and prime contractors building in-house teams present a clear threat of replication over time.
- **Result:** Temporary Competitive Advantage.

2. "Silent Hand" Technician Team

- **Analysis:** This team provides immense value and rarity. Their tacit, sensory-based knowledge is highly inimitable due to historical path dependency (18-year tenure) and causal ambiguity (the intuitive "feel" cannot be automated or documented). The company is structured to deploy them effectively.
- **Result:** Sustained Competitive Advantage.

3. Exclusive Supplier Agreements (Neodymium Composite)

- **Analysis:** The material provides essential value and is exceptionally rare. The agreement is inimitable due to historical conditions; current geopolitical trade wars and critical resource classifications make replicating this 25-year contract's pricing and guarantees impossible for competitors today.
- **Result:** Sustained Competitive Advantage.

Conclusion:

While the AMS is a strong foundational tool, AKS's true **Sustained Competitive Advantages** lie in the "Silent Hand" Technician Team and the Exclusive Supplier Agreements. These two assets are protected by insurmountable barriers to entry (tacit knowledge and historical legal contracts) that neither AI nor prime contractor budgets can replicate.

Annual Objectives and Key Results (OKRs)

These OKRs are designed to institutionalize the "Silent Hand" apprenticeship program and legally fortify the exclusive material supply chain, protecting your sustained advantages.

Objective 1: Institutionalize and scale the "Silent Hand" apprenticeship program to guarantee generational knowledge transfer.

- **Key Result 1.1:** Formalize the baseline sensory-feedback heuristics into a proprietary, highly secure internal training curriculum by the end of Q2.
- **Key Result 1.2:** Successfully advance 4 mid-level engineers through the 50-deployment threshold to achieve full "Silent Hand" certification by the end of the fiscal year.

Objective 2: Legally fortify and insulate the exclusive neodymium supply chain against geopolitical volatility.

- **Key Result 2.1:** Execute a legally binding, 10-year extension option with the Southeast Asian processor, locking in existing pricing tiers by Q3.
- **Key Result 2.2:** Complete a comprehensive geopolitical risk audit and establish one legally compliant, alternative transit/shipping route for the material to ensure zero supply disruptions.

Objective 3: Maximize the combined leverage of the "Silent Hand" team and exclusive materials to defend 100% of upcoming sole-source re-bids.

- **Key Result 3.1:** Integrate real-world calibration data from the "Silent Hand" team directly into the AMS to create a feedback loop that competitors' AI cannot access, increasing AMS field-prediction accuracy to 99.999%.
- **Key Result 3.2:** Develop and present 3 new performance-guarantee metrics in all upcoming contract proposals based strictly on the unique properties of the exclusive neodymium composite.

Chain-of-Thought VRIO and OKRs Output

Step 1: Assessment Logic (VRIO Analysis)

1. The "Axiom Modeling Suite" (AMS)

- **Value:** Yes. AMS provides critical value by successfully modeling chaotic, non-linear environmental risks and combined-effects environments with 99.99% accuracy, a capability standard COTS software lacks.
- **Rarity:** Yes. It is a proprietary system built internally over 15 years and is not available on the open market.
- **Imitability:** No. The suite is currently facing a high risk of substitution. Well-funded university spin-offs are commercializing AI-driven simulation tools that offer "good

enough" physics modeling, lowering the barrier to entry and threatening AMS's uniqueness.

- **Organization:** Yes. AKS is structured to exploit AMS, utilizing it as a primary technological pillar to secure and service its 15-year sole-source contracts.
- **Result:** Temporary Competitive Advantage.

2. The "Silent Hand" Technician Team

- **Value:** Yes. The team provides the indispensable post-installation calibration that ensures the absolute absence of measurable sound or vibration signatures, fulfilling the company's core promise.
- **Rarity:** Yes. A cross-disciplinary team of 12 senior engineers with an 18-year average tenure, requiring a 5-year/50-deployment apprenticeship, is exceptionally scarce within the engineering labor market.
- **Imitability:** Yes. The team's capability is deeply rooted in tacit knowledge, sensory feedback, and intuitive "feel." This makes it causally ambiguous and socially complex. It cannot be documented, automated by AI software, or rapidly duplicated by prime contractors' cost-cutting internal R&D teams.
- **Organization:** Yes. AKS successfully deploys this team to operationalize its solutions in the field, though there is room to better integrate their tacit knowledge back into the AMS development cycle.
- **Result:** Sustained Competitive Advantage.

3. Exclusive Supplier Agreements (Neodymium Composite)

- **Value:** Yes. Secures the non-standard rare-earth magnetic material that serves as the core component of AKS's proprietary vibration dampeners.
- **Rarity:** Yes. It is an exclusive 25-year contract with a single supplier, established before current geopolitical trade wars and critical resource classifications.
- **Imitability:** No. While the specific legal agreement and price-per-kilogram are highly defensible, raw materials are ultimately subject to technological substitution. Over the next decade, well-funded prime contractors or competitors may engineer alternative physical dampening mechanisms that bypass the need for this specific composite entirely.
- **Organization:** Yes. The organization fully leverages this supply chain to maintain superior performance and protect its premium pricing model.
- **Result:** Temporary Competitive Advantage.

Step 2: Conclusion Synthesis

Sustained Competitive Advantage: The "Silent Hand" Technician Team.

Implications: If the AMS and the Exclusive Supplier Agreements yield only a Temporary Advantage, it means AKS's technological and material moats are actively eroding. AI-driven simulation tools will eventually commoditize the AMS's predictive capabilities, and

competitors will eventually engineer alternative dampening materials to bypass the exclusive neodymium supply chain. Therefore, AKS's sole, long-term survival strategy hinges entirely on the tacit, human-driven calibration skills of the "Silent Hand" team. If AKS loses this team, or fails to scale their knowledge, the company will be outmaneuvered by cheaper, AI-powered COTS solutions.

Step 3: Action Planning (OKRs)

Objective 1: Scale the rare element by institutionalizing the "Silent Hand" tacit knowledge transfer.

- **Key Result 1.1:** Reduce the "Silent Hand" apprenticeship timeline from 5 years to 3.5 years by implementing a formalized, structured shadowing matrix for 6 new PhD-level hires by Q2.
- **Key Result 1.2:** Establish a formal feedback loop resulting in the successful translation of at least 5 field-calibration sensory heuristics into codified parameters within the AMS by the end of the fiscal year.

Objective 2: Protect the non-imitable element by establishing industry-leading retention and operational security for the Special Projects team.

- **Key Result 2.1:** Achieve 100% retention of the current 12-member "Silent Hand" team through restructured, long-term equity vesting and specialized compensation packages by Q1.
- **Key Result 2.2:** Execute non-compete and intellectual property re-affirmation agreements with all 12 team members, expanding legal protection over field-calibration methodologies by Q3.

Objective 3: Legally fortify the exclusive material supply chain to delay competitor substitution while the "Silent Hand" team scales.

- **Key Result 3.1:** Complete a comprehensive legal and geopolitical audit of the 25-year Southeast Asian supplier contract, closing any existing force majeure or trade-war loopholes by Q2.
- **Key Result 3.2:** Stockpile a verifiable 36-month strategic reserve of the specific neodymium-iron-boron composite in a domestically secure facility by Q4 to buffer against any sudden supply chain disruptions.

Persona VRIO and OKRs Output

MEMORANDUM

TO: Chief Executive Officer, Axiom Kinetic Systems (AKS)

FROM: Lead Partner, Competitive Strategy Practice

DATE: May 8, 2026

SUBJECT: VRIO Analysis & Strategic OKR Directive for Asset Protection and Contract Renewal

Please find the requested competitive strategy assessment and operational directives below.

VRIO Executive Summary: Isolating the Core Advantage

To successfully defend our sole-source contracts against emerging AI-driven modeling tools and internal prime contractor R&D, AKS must rely on assets that cannot be replicated through capital expenditure or algorithmic modeling.

- **Axiom Modeling Suite (AMS):** *Temporary Competitive Advantage.* While highly valuable and currently rare, AMS relies on predictive algorithms. Well-funded university spin-offs are already commoditizing complex physics modeling. AMS is necessary to play, but insufficient to win long-term.
- **Exclusive Supplier Agreements:** *Temporary Competitive Advantage.* The cost and performance barriers established by this 25-year contract are immense. However, heavy reliance on a single geographic source introduces catastrophic systemic risk in the current geopolitical climate, capping its viability as an unassailable advantage.
- **The "Silent Hand" Technician Team:** *Sustained Competitive Advantage.* This is the unassailable core of AKS. The tacit, sensory-based knowledge held by this team exhibits perfect causal ambiguity—competitors cannot replicate what cannot be documented. Their intuitive mastery of post-installation calibration, forged over an 18-year average tenure and a 50-deployment apprenticeship, guarantees the zero-margin-of-error outcome. AI can simulate a theoretical zero-signature environment, but only the Silent Hand can physically verify and enforce it in chaotic, real-world deployments.

Strategic Conclusion: AKS's ultimate moat is not its software or its supply chain, but the specialized human capital that synthesizes both. Our immediate strategy must focus on aggressively institutionalizing this tacit knowledge, securing the supply chain it relies upon, and leveraging this combined force to defend our re-bidding cycle.

High-Aspiration Strategic Objectives and Key Results (OKRs)

Based strictly on the "Silent Hand" as our Sustained Competitive Advantage, the following OKRs mandate the monetization, institutionalization, and defense of this core asset.

Objective 1: Institutionalize the "Silent Hand" tacit knowledge to eliminate human-capital bottlenecks and scale deployment capability.

- **KR 1.1:** Digitize and map 100% of the currently undocumented sensory-feedback calibration protocols into a proprietary training matrix by Q2.

- **KR 1.2:** Reduce the mandatory apprenticeship timeline from 5 years to 3 years without sacrificing deployment quality, utilizing augmented reality (AR) overlay simulations of past deployments.
- **KR 1.3:** Graduate and certify four new "Silent Hand" technicians to field-ready status by the end of Q4.

Objective 2: Legally fortify and insulate the exclusive material supply chain to guarantee the Silent Hand's operational superiority.

- **KR 2.1:** Execute a binding, 10-year legal extension with the Southeast Asian neodymium composite supplier by the end of Q3, locking in current price-per-kilogram metrics.
- **KR 2.2:** Establish and fund one geographically distinct, secure domestic stockpiling facility holding a 24-month reserve of neodymium composites by Q4, mitigating all single-point-of-failure geopolitical risks.

Objective 3: Monetize the unassailable nature of our calibration capability to secure 100% of upcoming sole-source contract renewals.

- **KR 3.1:** Integrate "Mandatory Tacit-Calibration Audits" (performed exclusively by the Silent Hand) into the compliance requirements of all upcoming Requests for Proposal (RFPs) for our legacy defense clients by Q2.
- **KR 3.2:** Secure 100% renewal of our existing 15-year contracts by Q4, explicitly leveraging our verified 0% failure rate as a metric AI competitors cannot legally guarantee.
- **KR 3.3:** Capture initial market share in the deep-sea robotics sector by securing two anchor contracts valued at \$10M+ by Q4, utilizing the Silent Hand as a premium verification service.

4.3 Quantitative Results from Likert-scale questions

In the previous section, I presented the questionnaire which contained four questions with the same Likert scale. Those are questions one, three, five, and seven, and ask the reviewers to evaluate the PESTEL analysis of each method (ZS, CoT, and Persona), the same for the VRIO analysis, and there are two questions for the evaluation of the OKRs that come out from each method. The goal is to not only evaluate the methods but identify which one(s) perform better according to the reviewers. A detailed breakdown for each question, followed by comparisons, can be found below.

Question 1: PESTEL Analysis

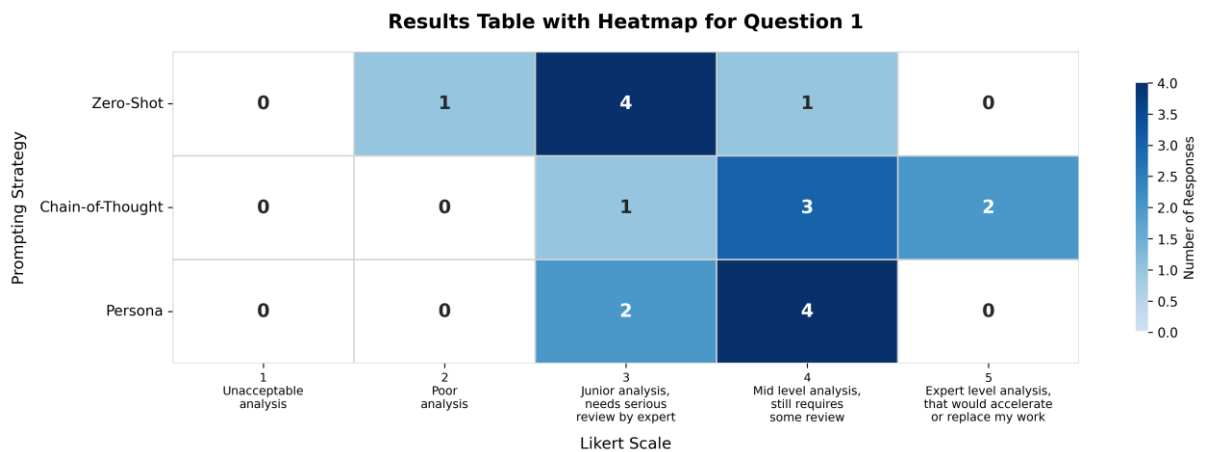


Figure 1: Results with heatmap for Question 1

The data shows that across all three prompting strategies, responses clustered around the mid-range ratings (3 and 4), with no responses at the extremes (1 or 5).

Zero-Shot produced the most spread-out distribution, with 4 responses at rating 3, and 1 each at ratings 2 and 4. This suggests evaluators found Zero-Shot PESTEL analyses generally passable but requiring serious expert review.

Chain-of-Thought shifted the distribution noticeably upward: 3 responses at rating 4 and 2 at rating 5 — the only prompting method to receive any rating-5 responses in this question. This indicates that structured reasoning meaningfully improved PESTEL output quality.

Persona also leaned toward the higher end, with 4 responses at rating 4 and 2 at rating 3, but unlike Chain-of-Thought, it produced no expert-level (5) responses.

Overall, Chain-of-Thought appears to be the strongest method for PESTEL analysis, capable of producing work that could accelerate or replace expert work, while Zero-Shot is the weakest.

Question 3: OKRs derived from PESTEL (Question 1)

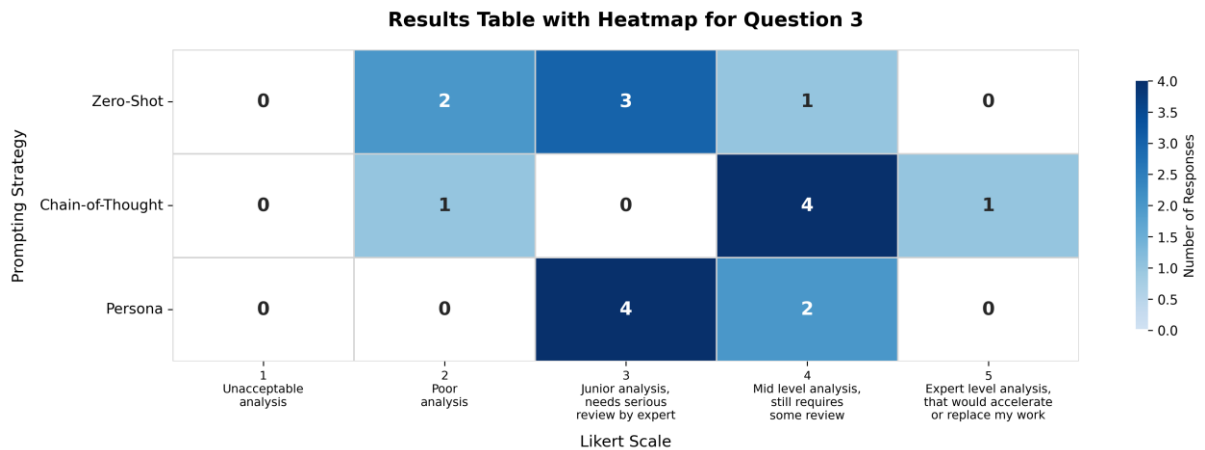


Figure 2: Results with heatmap for Question 3

This question examines whether the quality of the upstream PESTEL analysis translated into quality OKR generation.

Zero-Shot produced the most varied results: 3 responses at rating 3, 2 at rating 2, and 1 each at ratings 4 and 5. The spread is the widest of the three methods, suggesting inconsistency.

Chain-of-Thought shifted toward rating 4 (4 responses), with 1 each at ratings 2 and 5. This mirrors its strong performance in Question 1, suggesting the structured reasoning carries through to downstream tasks.

Persona concentrated heavily at rating 3 (4 responses) and rating 4 (2 responses), with no responses at either extreme. It performs more consistently than Zero-Shot but does not reach the highs of Chain-of-Thought.

Overall, the OKR quality from PESTEL largely mirrors the PESTEL findings: Chain-of-Thought leads, Persona is consistent in the middle, and Zero-Shot is the most erratic.

Question 5: VRIO Analysis

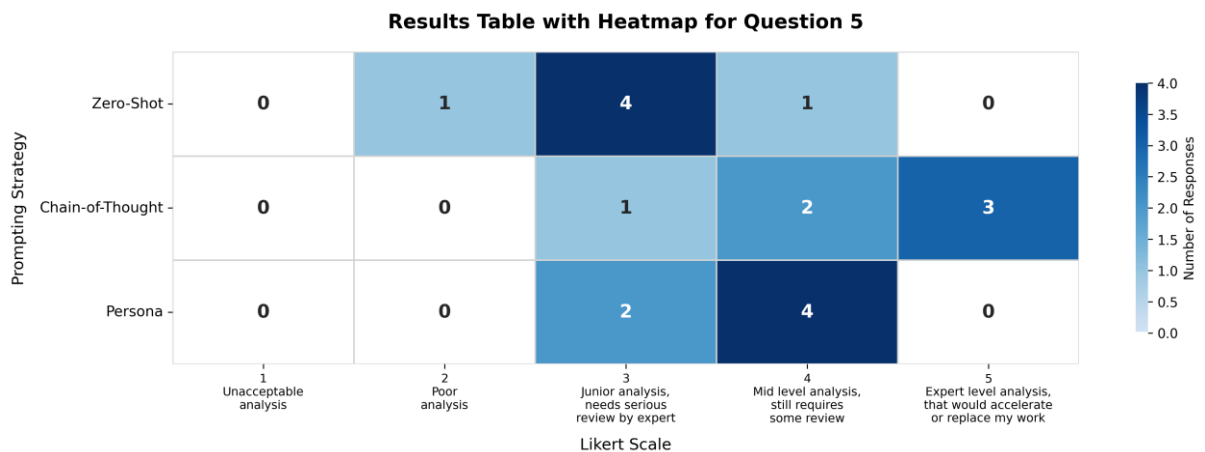


Figure 3: Results with heatmap for Question 5

Zero-Shot again concentrated at rating 3 (4 responses), with 1 at rating 2 and 1 at rating 4 — an almost identical pattern to its PESTEL performance, suggesting that Zero-Shot consistently produces junior-level work regardless of the framework.

Chain-of-Thought showed a strong upward shift: 3 responses at rating 5 and 2 at rating 4, with only 1 at rating 3. This is the highest-performing distribution across all questions and all methods in the entire dataset — notably stronger even than its PESTEL performance.

Persona mirrored its PESTEL result almost exactly: 4 at rating 4, 2 at rating 3, nothing at extremes, which is a very reliable mid-level output.

Overall, VRIO analysis appears to particularly benefit from Chain-of-Thought prompting, which achieved its best results here. The framework's structured nature (Value, Rarity, Imitability, Organization) may align well with step-by-step reasoning.

Question 7: OKRs derived from VRIO (Question 5)

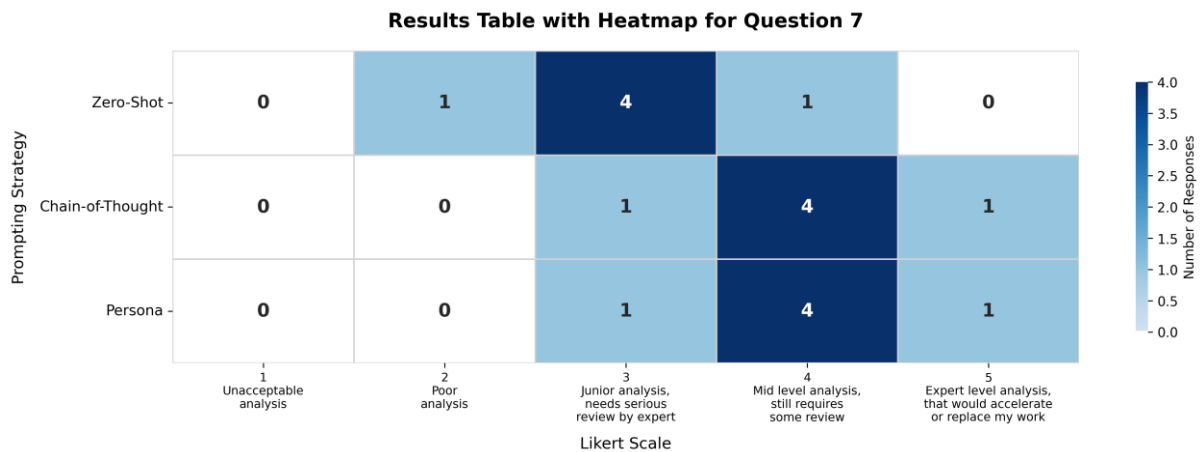


Figure 4: Results with heatmap for Question 7

Zero-Shot repeated its familiar pattern: 4 at rating 3, 1 at rating 2, 1 at rating 4 — consistent with all its prior results and suggesting a ceiling effect for this method.

Chain-of-Thought and Persona produced identical distributions: 4 responses at rating 4, 1 at rating 3, and 1 at rating 5. This is a striking convergence, as the two methods performed quite differently on the upstream VRIO analysis.

Notably, Chain-of-Thought's performance dropped relative to Question 5 (where it dominated at rating 5), suggesting that even strong VRIO analysis does not fully translate into proportionally strong OKR generation.

Overall, the gap between methods narrows considerably here, with Chain-of-Thought and Persona converging, while Zero-Shot remains behind.

Cross-Question Comparisons

1. Consistency of Zero-Shot across all questions: Zero-Shot is remarkably consistent and consistently limited. Across all four questions, it clusters at rating 3 with minor spread into ratings 2 and 4 and achieves rating 5 only once (Q3). It appears to have a hard ceiling around junior-to-mid-level quality regardless of the analytical framework or task type.
2. Chain-of-Thought is the strongest but variable method: Chain-of-Thought is clearly the top performer overall, but its advantage is not uniform. It peaks on VRIO (Q5) and performs solidly on PESTEL (Q1) but converges with Persona on Q7. This suggests its strength is most pronounced on structured analytical frameworks and slightly less so when generating strategic deliverables like OKRs.
3. Persona is the most reliable mid-tier method since it consistently lands in the 3–4 range with very little variance. It never reaches the highs of Chain-of-Thought but also never dips to the lows of Zero-Shot. For contexts where predictability matters more than peak performance, Persona offers a dependable option.
4. OKRs are harder than the analyses that precede them: Comparing Q1→Q3 and Q5→Q7, there is a consistent pattern: OKR quality does not fully inherit the quality of the upstream analysis. Chain-of-Thought's exceptional VRIO performance (Q5) does not produce proportionally exceptional OKRs (Q7), and the methods converge more on OKR tasks. This suggests that OKR generation introduces its own complexity that current prompting strategies handle more uniformly.
5. VRIO vs. PESTEL: Chain-of-Thought handles VRIO better than PESTEL, while Persona and Zero-Shot perform comparably on both. This may reflect that VRIO's rigid four-dimension structure is particularly well-suited to step-by-step reasoning, while PESTEL's broader, more open-ended scope benefits less from it.

4.4 Qualitative Analysis of Reasoning for open-ended questions

Questions 2, 4, 6, 8, 9, and 10 are open-ended so that reviewers can give their expert opinion. The summaries of the experts' answers follow.

Question 2: Strengths and weaknesses in PESTEL analysis.

Chain-of-Thought (CoT) Strengths: CoT was considered the best method by most respondents due to its strong analytical rigor, ability to map interdependencies (especially the social-political-legal feedback loop), and capacity to approximate traditional deductive logic. It shifts the analysis from a flat checklist to a dynamic system view, making the underlying logic transparent and the strategic inferences verifiable.

Persona Approach Strengths: One respondent preferred the Persona approach because the output was more structured, easier to read, and contained more concrete arguments.

However, it was noted that this benefit largely stems from the format requested in the prompt, and all methods identified similar core PESTEL items.

Chain-of-Thought Weaknesses: Common weaknesses cited were that the output is verbose and not executive-ready as-is, requiring clean-up before presentation. By design, CoT tends to skip on the Technological, Environmental, and Legal factors, leading to an underdeveloped comprehensive sweep, particularly regarding noise regulation trends and regulatory constraints like airworthiness certification timelines.

General Weaknesses & Nuance: Specific expressions in the OKRs (e.g., "0% critical safety incidents," "engage legislators within 24h") were criticized as unrealistic and not achievable. Other weaknesses across the methods included underrepresented cost of liabilities (insurance) and a failure to factor in the company's technology readiness levels when analyzing technical aspects (e.g., varying weather conditions).

Question 4: Strengths and weaknesses in the OKRs coming from the PESTEL analysis.

Chain-of-Thought (CoT) Strengths and Weaknesses: CoT was considered the strongest method because its Objectives and Key Results (OKRs) are directly traceable to the synthesized strategic challenge or identified risks, enabling a CEO to immediately understand the rationale. The Key Results (KRs) are largely SMART, balance leading and lagging indicators, and correctly focus resources on high-leverage interventions (e.g., securing social license, building a regulatory moat). However, weaknesses include aspirational targets like "0% critical safety incidents" or "zero privacy-related litigation," which are unrealistic and can lead to under-reporting; missing baselines for year-on-year comparison (e.g., reducing costs by 15%); and the crucial omission of any KR tying back to the stated \$50M revenue run rate goal.

Persona Strengths and Weaknesses: The Persona approach was also rated as the best method by some, offering a more structured, coherent, and executive-level framing, with aspirational but not vague objectives and KRs that included actual deadlines. The primary weakness cited was a basic formatting issue where KRs were numbered continuously across all objectives (KR1 through KR6) instead of resetting per objective, which would confuse ownership. This method also failed to connect back to the \$50M revenue goal.

General Weaknesses Across Methods: Across all methods, a major concern is the lack of feasibility consideration for KRs (e.g., "20% reduction of noise" or "Maintain zero privacy-related litigation"), indicating that significant hand-holding and several iterations would be required to produce defensible OKRs. Another weakness is the tendency to become overly explicit with specific mathematical numbers that may not make sense.

Overall Method Comparison: One expert noted that all methods produced roughly the same results, with the Persona approach having a slight edge in producing a more structured and coherent output with quarterly goals, possibly due to different prompting.

Question 6: Strengths and weaknesses in VRIO analysis.

Chain-of-Thought (CoT) Strengths: CoT was considered the clear winner due to its rigorous, sequential, step-by-step structure that mirrors proper analysis, making the output highly auditable and easier to follow, correct, or fine-tune. This analytical discipline prevents stochastic guessing and forces the model to address strategic consequences, such as exploring implications if advantages are only temporary. CoT was the only method that correctly flagged the supplier agreement as a temporary rather than a sustained advantage.

CoT Weaknesses: The primary drawback of CoT is its failure to synthesize how different assets interact, treating each asset in a vacuum; for example, it missed that the "Silent Hand" relies heavily on exclusive material, meaning erosion of the supplier moat indirectly weakens the sustainable competitive advantage (SCA). Other weaknesses include an underdeveloped Organization dimension, simply stating "yes they deploy them" is insufficient, and not providing a timeline for when temporary advantages start eroding.

Persona Strengths & Weaknesses: The Persona method was liked for its structured output and articulation of arguments, suggesting the strategic advantage is limited to just the "silent hand," which is seen as more realistic since agreements may fall apart. A weakness noted in the Persona method is that the discussion in the VRIO section does not align well with the proposed action plan.

General Weaknesses: A common weakness across responses is that none piggybacked on past relevant movements, such as the risk that eroding moats may lead to financial decline, causing technical personnel ("silent hand") to leave for emerging competitors. CoT was also noted to potentially force a binary answer in situations where reality is probabilistic.

Question 8: Strengths and weaknesses in the OKRs coming from the VRIO analysis.

Strengths of the Persona Method (Best for OKRs): The Persona OKRs are the strongest overall due to their clear focus on **monetization**, explicitly translating competitive advantages into tangible commercial outcomes such as securing anchor deals in new market segments and contract renewals. The objectives are well-structured, ambitious, and organized into clean mental models like 'monetize, institutionalize, and defend' (or 'institutionalize, fortify supply chain, monetize'). The Key Results (KRs) are genuinely

SMART-aligned and include real deadlines, making the document ready for executive implementation.

Weaknesses and Feasibility Issues: A primary weakness is the inclusion of targets that are **unrealistic** or mathematically prescriptive, such as aiming for "100% contract renewal" or "100% retention," which is considered a vanity metric since real-world attrition is inevitable. Other unrealistic goals cited include the complete digitization of tacit knowledge by Q2.

Gaps in Risk and Strategy: The OKRs lack specific risk mitigation, failing to address the gap in the Aerospace Manufacturing System (AMS), which is a real risk. There is also a recognized need for risk mitigation related to the workforce (silent hand) being open to poaching from competitors.

Optimal Approach: The optimal approach would be a **hybrid method**, merging the strong monetization framework from Persona with the rigorous protective Key Results from the Chain-of-Thought method, as neither method is ideal in isolation.

Question 9: Prompting methods comparison.

Framework Preference: The Chain-of-Thought (COT) approach consistently dominated analytical outputs, specifically for the PESTEL and VRIO frameworks, due to its ability to reward a rigorous, step-by-step approach, provide reasoning transparency, and reduce the model's tendency to jump directly to a final answer.

Deliverable Preference: The Persona approach took the lead for deliverable outputs, such as OKRs, because forcing the model into an "executive" mindset prioritized commercially actionable language and clear directives over exhaustive academic completeness.

Zero-Shot Performance: The Zero-shot approach consistently provided a solid, competent baseline but never ranked first, often falling back on generic templates and treating every variable as equally important due to the lack of extra scaffolding.

Optimal Workflow: The most effective strategy is likely a chained workflow, using Chain-of-Thought to build the base analysis and then using Persona to rewrite and frame the results for an executive audience.

Question 10: AI usage and improvements.

Role of AI in Strategic Management: AI is primarily viewed as a powerful analytical accelerator and a first-draft tool, rather than a replacement for strategic judgment, freeing human time for nuanced judgment calls and sensitivity analyses. The strongest approach suggested is a human-in-the-loop system where AI handles decomposition, scenario generation, and consistency checks, while leaders provide judgment and prioritization.

Preferred Prompting Methods: a common and effective approach involves a two-pass system: utilizing Chain-of-Thought (CoT) prompting first to map out the reasoning, surface deep findings, and highlight interdependencies to create an analytically defensible base document, followed by a Persona prompt to translate those findings into a polished, and executive-ready deliverable.

Necessary Improvements to the Approach: the most critical improvement is grounding the prompts in actual internal organizational data (financials, customer metrics, competitive intelligence, HR data) to anchor the analysis in reality instead of generic case studies. Respondents also suggest enforcing strict baselines and verification methods for every Key Result (KR) to make OKRs measurable and separating data/facts from recommendations.

Enhancing Review and Logic: improvements include using multi-turn conversations and iterative processes (completing PESTEL/VRIO before moving to OKRs), and adding a dedicated review step where the AI is prompted to attack its own output from an adversarial perspective (e.g., a ruthless competitor or skeptical board member) to find contradictions and double-check non-facts.

5. Conclusion, Managerial Playbook, and Future Research

In this chapter, I will discuss and summarize the findings of the research, present a managerial playbook, and present future research.

5.1 Summary of Findings

Both qualitative and quantitative data show something very critical for managers wanting to leverage AI for strategic management: the zero-shot approach is simple and easy to formulate, but the output is lower quality compared to the Chain-of-Thought or the Persona methods, which are also not enough for full automation of the work. From the qualitative answers of the experts, it is obvious that they will use the AI outputs along with their own personal judgment, i.e., they don't plan to fully automate the process of strategic management. They will be using CoT and Persona though to accelerate their work, but they will "push" the AI more by having it separate data from suggestions, build executive summaries for an easier high level pass, make it double check the numbers in the OKRs (and add proper baselines).

Chain-of-Thought seems to be the clear winner, if only method needs to be selected, and it seems to perform at its best in the VRIO analysis, most probably because the sequential nature of both the method and the analysis seem to interplay perfectly. If there are no constraints in methods, the most optimal path seems to be a CoT first for both PESTEL and VRIO, human review, then followed by a Persona for the OKRs.

5.2 Conclusion

At the current status of AI/LLMs full automation of the process of strategic management is not feasible. Still, a well-trained and correctly prompted AI system can help executives and decision makers accelerate their work, both in conducting PESTEL and VRIO analysis, as well as setting goals for their organizations. If managers invest some time in better prompting, they can get much better results, and great acceleration of their work. Finally, since strategic management is a recurring process, having some solid fundamentals will make the upcoming runs much faster and more efficient.

5.3 Managerial Playbook

From the thesis, we see that managers can benefit greatly, through acceleration of work, from using AI in strategic management. Since the token cost of all the methods is relatively low and very similar for each method, the cost of AI usage, even for multiple runs, is not prohibitive.

Managers should begin by creating a more detailed business case than the one presented in this thesis. Here, I had to create a fictional and generic firm, with just enough information to make the process run. In a real-world scenario, that would require a lot more information with a lot more detail which would result in better outputs. Information like actual costs and financials, the firm's vision and mission, previous strategies and lessons learned, can help massively in the production of more helpful results. This upfront "cost" will pay off very fast, because analysis like PESTEL and VRIO need to be updated from time to time.

Secondly, if only one method needs to be chosen, that will be the CoT, and its prompts can also be enhanced further, since different organizations want different things, and some details could be critical. Since most experts don't plan to fully automate the process, it would be good to separate the PESTEL and VRIO prompts from the OKR prompts; this way the experts can review the PESTEL or VRIO first, and then make the OKR prompt even more fine-tuned based on the information they got from the previous step. The optimal path includes the Persona as well: after PESTEL and VRIO are done with CoT, the human reviews, and the Persona is used to create OKRs that are more fitting for the executives.

Finally, since the process is not fully automated, reviews need to happen from the stakeholders in the company. If AI can produce 70-80% of the needed output very fast and efficiently (to quote one of the experts who responded to the questionnaire), then the manager should review and complete the rest. As usual, the output will be presented to the c-suite (or any decision makers) for the final review, before making it official strategy and goals of the company.

5.4 Future Research

The knowledge area of LLMs/AI has been accelerating a lot recently. New models with enhanced capabilities come out every few months, so future research needs to address that. Another direction is of course agents: an organization can train a number of agents, based on CoT and Persona, and make them compete with each other to produce better results.

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Appendix A: Full reviewers' responses to open-ended questions

Q2. In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the PESTEL analysis?

Honestly, I'd put both Chain-of-Thought and Persona right at the top of the pack, though I'd give a slight edge to Chain-of-Thought just for the sheer analytical rigor it brings.

What makes it really shine is how it handles interdependencies. Instead of just giving you a static list, it actually maps out the system, showing for example how a localized social incident can trigger a regulatory ban, which then cascades into economic fallout. That shift from a flat checklist to a dynamic system view is exactly what separates a basic PESTEL from an expert one. It also avoids that classic AI trap of treating every factor as equally important by forcing the model to zero in on the single biggest risk and opportunity. Plus, because the underlying logic is totally transparent, a reviewer can easily trace the work to see exactly where the model nailed it and where it went off track.

The main drawback? By design, it definitely skimps on the Technological, Environmental, and Legal angles, so you aren't getting a comprehensive six-factor sweep.

Ultimately, it comes down to what you need. If you're looking for a polished, executive-ready draft that requires zero tweaking, Persona is your best bet. But if you need a solid, defensible foundation to actually build upon, Chain-of-Thought is the clear winner.

I consider Chain-Of-Thought to be the best for the PESTEL analysis. It demonstrates solid strategic thinking and mimics how experienced operators think. The output strategically resonates not just categorizes.

Some expressions though like "0% critical safety incidents" or "engage legislators within 24h" feel a not aspirational and not realistic. Real OKRs must be achievable not ambitious.

I considered the persona approach best. It is good that the output is more structured and reads easier and admittedly there are somewhat more concrete arguments in what is presented. This however is also an artifact of the prompt, which clearly asks the output to be in this specific format.

All methods identified more or less the same PESTEL items so the edge of the persona is coming mostly from the presentation style.

CoT was the best for PESTEL. The main thing it got right that the others didn't was the interdependency mapping - specifically the social-political-legal feedback loop. One bad incident triggers political pressure which triggers legal bans, that's how UAM markets actually collapse. Zero-shot missed this completely, it just listed factors.

Weakness - it's verbose and not executive ready as-is. Environmental factor was also underdeveloped which is a real gap given noise regulation trends. Would need cleanup before presenting to a board.

I prefer Chain-of-Thought because it approximates traditional logic rules. By forcing the model to expose its step-by-step deductive process, the strategic inferences become verifiable.

Strengths:

- consideration of timely economic realities (e.g. bump of material costs)
- broad analysis of factors

Weaknesses:

- some of the technological analysis may be weak in the sense of not factoring in the technology readiness levels of the company (e.g. varying weather conditions depending on geography)
- overall the regulatory constraints are not extensively considered or factored in (e.g. it is known that getting an airworthiness certification for a new UAV can take years/millions, depending on the use case), both in terms of investment and/or technology readiness (e.g. altitude of air corridors that will be normally granted).
- overall the cost of liabilities (insurance) is underrepresented

Q4. In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the OKRs analysis?

I'd argue that the Chain-of-Thought OKRs are the strongest of the bunch.

Their biggest selling point is traceability. Because each Objective ties directly back to the synthesized strategic challenge, a CEO can look at it and immediately understand exactly why that specific OKR was chosen over a dozen other possibilities. The Key Results themselves are largely SMART, and they do a great job of balancing leading and lagging indicators. More importantly, instead of spreading resources thin across every single PESTEL factor, they correctly zero in on the highest-leverage

interventions—things like securing social license, building a regulatory moat, and landing high-value contracts.

That said, they aren't without flaws. For one, targets like "0% critical safety incidents" or "zero privacy-related litigation" might sound great on paper, but they're incredibly unrealistic at scale. In practice, aspirational metrics like these tend to create perverse incentives, where teams are more likely to quietly under-report issues than actually miss the KR.

There are also a few missing pieces. Several of the KRs lack a clear baseline for their year-on-year comparisons. When it says to "reduce battery degradation costs by 15%," you're left wondering: is that a 15% drop from the current 2025 cost, or against a supplier benchmark?

Finally, and perhaps most crucially, not a single KR ties directly back to the \$50M revenue run rate goal. Given that this is the stated three-year objective, it's a pretty glaring omission. The OKRs effectively map out the operating conditions needed to generate revenue, but they completely forget to measure the revenue itself.

Chain-Of-Thought wins, the OKRs are directly connected to identified risks. Still some minor weaknesses like "Zero critical incidents". A target like " $< X$ incidents / million flights" could be a better metric.

The overall methods seem to me that they are producing roughly the same results, with a key difference (which is also due to the different prompting) that the persona approach is producing 2 KRs vs 3 of the other methods (in the other two the wording of 3 OKRs is ambiguous). There is a slight edge of the persona approach in that the output is more structured and more coherent but I believe this is due to the prompting. Persona seems to present somewhat more specific OKRs with quarterly goals.

Overall, none of the methods discussed (or seems to take into account) anything about feasibility (e.g. 20% reduction of noise - is that feasible? Maintain zero (0) privacy-related litigation - is that practically feasible?) As a result, all methods would require significant hand-holding and several iterations to produce a presentable and defensible PESTEL analysis with OKRs.

Persona was best for OKRs. The framing was executive, objectives were aspirational without being vague, and the KRs had actual deadlines attached.

Main weakness - the KRs were numbered KR1 through KR6 across all objectives instead of resetting per objective, that's a basic formatting issue that would confuse ownership. Also doesn't connect back to the \$50M revenue goal at all, which is the whole point.

focusing on the weaknesses, the model can become too explicit into mathematical numbers that are too specific to make sense

Strengths:

- good staggered build up of the factors, from primary analysis to synthesis to OKRs.

Weaknesses:

- same as above

Q6. In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the VRIO analysis?

I'd say Chain-of-Thought emerges as the clear winner when it comes to the VRIO analysis.

Its main advantage lies in how it structures the evaluation. Rather than jumping straight to a broad, holistic judgment, it forces a rigorous, sequential test for every single VRIO criterion.

Because of this step-by-step approach, the output is highly auditable. If a reviewer disagrees with a specific rating, they can isolate and challenge that one point without having to dismantle the entire conclusion.

Another major plus is the section exploring the implications if the other two advantages were only temporary. That specific addition pulls the framework out of the realm of pure academic theory and forces the model to address actual strategic consequences.

The main downside, however, is its failure to synthesize how different assets interact with one another. It basically treats each asset in a vacuum. For instance, it misses the fact that the "Silent Hand" relies heavily on the exclusive material. As a result, it fails to point out that if the supplier moat starts to erode, it indirectly weakens the entire sustainable competitive advantage (SCA).

Chain-of-Thought forces analytical discipline with better strategic explainability but in some cases may force a binary answer where reality is probabilistic.

I really liked the structured output and the articulation of the arguments. The fact that persona suggests that the strategic advantage is just one the silent hand (vs 2 of zero-shot with the addition of exclusive agreements) is more realistic as agreements may fall apart.

One weakness is that the discussion in the VRIO section does not seem to go hand-in-hand with the action plan.

CoT was the best for VRIO. The step-by-step logic actually mirrors how you'd do this analysis properly. What stood out - it was the only one that correctly flagged the supplier agreement as a temporary advantage, not sustained. That's a nuanced call and the others missed it.

Weaknesses - the Organization dimension was underdeveloped, just said 'yes they deploy them' which isn't enough. And it doesn't give you a timeline on when these temporary advantages start eroding, which you'd need for actual planning.

I like chain of thought because it makes the process easier to follow and thus best to correct or fine tune later. This prevents stochastic guessing and allows an executive to audit the logic before making million-dollar strategic decisions

I am aligned with all three responses when it comes to AKS and the 20-year contract agreement. While I would be on the fence as to whether the "silent hands" moat is a long-term sustainable one, I agree with the risks posed by the two last responses in terms of reducing the risk of countering attrition/scaling the moat by shortening the certification program.

Overall, a weakness is that none of the responses piggybacked on past relevant movements. The 2/3 eroding moats may lead to financial decline, which in turn may lead to the "silent hand" technical personnel jumping ship, also in light of other emerging leading competitors arising. The case with Intel "tribal VLSI/integration/tape-out" losing such "silent hands" is testimony to that.

Q8. In your expert opinion, which are the strengths and weaknesses of the method that you considered best for the OKRs analysis?

I'd argue that the Persona OKRs are the strongest overall.

The real deciding factor here is the clear focus on monetization. Objective 3, for instance, does an excellent job of explicitly translating competitive advantages into tangible commercial outcomes. Think contract renewals and securing anchor deals in completely new market segments.

Between the aspirational framing and the fact that the Key Results are genuinely SMART-aligned, this document is practically ready to be handed off to an executive right out of the gate. I also appreciate the overarching format. Organizing it into three distinct pillars—monetize, institutionalize, and defend—provides a much cleaner mental model than the "scale, protect, fortify" split we saw in the Chain-of-Thought version.

That said, it does have a few weaknesses. Several of the targets tip over from being aspirational to flat-out unrealistic. Aiming for "100% contract renewal," for example, is essentially a vanity metric, as any real-world renewal cycle will inevitably experience at least some natural attrition.

If this were a real client engagement, I wouldn't actually use either method in isolation. The optimal approach would be a hybrid: taking the strong monetization framework from Persona and merging it with the rigorous protective Key Results from Chain-of-Thought.

Direct linkage to the strategic diagnosis and good balance between defensive and scaling objectives still there are some unrealistic goals like "100% retention is unrealistic"

OKRs for persona are well-structured and seem somewhat more ambitious compared to the other two methods (it talks about growth).

On the other hand some claims seem unwarranted (again there are feasibility issues). For example, 100% renewals, digitization) and I would like to see some risk mitigation as an OKR since the workforce (silent hand) is the key asset and may be open to poaching from competitors.

Persona was the best for OKRs here. The objectives were clearly split - institutionalize, fortify supply chain, monetize. That third one about going after deep-sea contracts was actually smart, not just defensive. KRs had real deadlines.

Big weakness - saying you'll digitize 100% of tacit knowledge by Q2 is unrealistic, that's kind of the point of tacit knowledge. Also no OKR for the AMS gap which is a real risk.

The resulting OKRs can sometimes be too rigid or mathematically prescriptive.

As above. I think the last two approaches cover the problem with a more critical stance and risk management actions.

Q9. Across both case studies, did the same prompting approach consistently perform best, or did the strongest approach differ depending on the framework being applied? What might explain that?

Was there a single consistent winner across all tasks? Not exactly. Chain-of-Thought clearly dominated the analytical outputs, like the PESTEL and VRIO frameworks. Those tasks genuinely reward a rigorous, step-by-step approach. Whether it's mapping out complex interdependencies or running a sequential test, the visible reasoning in Chain-of-Thought actually helps the model catch its own mistakes mid-process.

On the flip side, Persona took the crown for deliverable outputs. By forcing the model into an "executive" mindset, it naturally prioritizes real-world commercial action over exhaustive academic completeness. It gives you clear directives rather than just a list of findings. Zero-shot performed exactly as you'd expect: it provided a solid, competent baseline, but it never took first place. Without that extra scaffolding, the model just falls back on generic templates and treats every variable as equally important.

Ultimately, when you need to turn raw analysis into prioritized, commercially actionable language, Persona is the way to go because the role-play element provides the focus that the raw framework lacks. The real takeaway here? The best approach isn't picking just one. A chained workflow, using Chain-of-Thought to build the base analysis and Persona to rewrite it for an executive audience is going to yield much stronger results than any single method on its own. Comparing them in isolation really understates what the technology can do.

COT worked best for both cases due to the fact felt more consistent, performed in prioritization and reasoning transparency. I'd say that it reduces the model's tendency to jump directly from "pattern recognition" to "final answer."

The same approach performed the best.

No, it wasn't consistent. For PESTEL, CoT was clearly better - the whole social-political-legal feedback loop analysis was the kind of thing that actually changes how you think about the strategy. Zero shot was too listy.

For VRIO analysis same story, CoT wins. But for OKRs Persona was stronger both times because the framing was more executive and action-oriented. Analysis tasks need the reasoning visible, OKRs need to sound like decisions not reports.

In my view, Chain-of-Thought consistently performs best across both PESTEL and VRIO.

Overall, I think the chain of thought approach was the most consistent. While "chain of thought" is a marketing term (internally, the model does not think, it just does staggered next token prediction), empirically it does build up content on the basis of previous findings/arguments used in staggered prompts.

Q10. In your expert opinion, after seeing both PESTEL and VRIO analysis with their relevant OKRs, how would you use AI for strategic management in your actual work/organization? How would you improve the existing approach even further?

Ultimately, I see AI as a powerful analytical accelerator and a tool for generating first drafts, rather than a replacement for actual strategic judgment. In practice, I would run a two-pass system. First, I'd use a Chain-of-Thought prompt to map out the reasoning,

surface the deep findings, and highlight the interdependencies. That becomes my analytically defensible base document. Then, I'd run a Persona prompt to translate those findings into a polished, executive-ready deliverable. Before sending anything forward, I'd cross-reference the Persona output against the Chain-of-Thought version to make sure no crucial logic was lost in translation. Frankly, I wouldn't trust any single-pass AI output for a decision that carries real strategic or financial weight.

To take this approach to the next level, I'd recommend a few key adjustments. First, the prompts need to be grounded in actual internal data. Right now, the outputs are a bit generic because they're based on a standalone case study. In a real-world scenario, you'd want to feed the model your own financials, customer metrics, and competitive intelligence so the analysis is anchored in reality, not just plausible-sounding generalities. Second, we need to enforce strict baselines for every Key Result. If an OKR says to "reduce X by 15%," the prompt itself needs to demand a starting value and a verification method. Without baselines, these KRs are virtually impossible to measure in practice. Finally, I'd add a dedicated review step. Basically prompt the AI to attack its own final output from the perspective of a ruthless competitor or a highly skeptical board member. Without that pressure, you end up letting aspirational fluff like "0% safety incidents" slip right through the cracks.

With those guardrails in place, I'd comfortably rely on AI to generate 70 to 80 percent of a strategy document's first draft. That frees up my time to focus on the things models still struggle with: making nuanced judgment calls, running sensitivity analyses, and reading the political temperature of the room.

AI is most valuable in strategic management not as a replacement for leadership, but as a structured reasoning amplifier that continuously decomposes, stress-tests, and synthesizes strategic decisions.

Chain-of-thought prompting works especially well for frameworks like VRIO and PESTEL because it forces explicit causal and sequential reasoning instead of superficial business-pattern matching.

The next evolution is connecting AI to real organizational telemetry (delivery, incidents, hiring, financials, market signals) to continuously monitor moat erosion, strategic drift, and OKR alignment.

The strongest model is human-in-the-loop strategy: AI handles decomposition, scenario generation, and consistency checks, while leaders provide judgment, prioritization, and accountability.

Here are some thoughts:

* I would consider more detailed prompts that would ask for things such as: a) take into account risk mitigation b) feasibility c) research on current state of the market/data/engineering/IP d) resourcing (for OKRs)

* Ask the AI to review the output adversarially. Ask the AI to find contradictions and double check for non-facts.

* Ask for variants that argue for different (opposing positions). E.g. for AKS should we focus on the silent hand or the licensing or both? Argue for and against.

* Maybe separate the data and facts from the recommendations. They seem interleaved in the response right now.

* I would go in iterations for PESTEL and VRIO and move to OKRs only after that is done and completed. Going with both deliverables at the same time is somewhat sub-optimal as in some sense one (OKRs) depend on the other.

* Would be useful to have a short executive summary. Certain AIs tend to be very verbose.

* There is a latest trend of using the Aristotelian method (ask AI to boil everything you gave it to basic true facts and build up from there). Would be interesting to see the inductive logic in the recommendations.

* Definitely have the AI check all the numbers - 100% or \$10M seem random.

* Iterate and have different AIs review each other's work adversarially (ask AI B to find at least one problem in the output of AI A).

Honestly i'd use it as a first draft tool, not a final one. Run CoT for the analysis to get the logic right, then Persona to produce the output that goes to leadership. That combo would save alot of time in my workflow.

To improve it - you need real data in the prompts, not just a case summary. Give it actual numbers, regulatory documents, competitor intel. Also multi-turn conversations beat single prompts every time, the AI gets sharper when you push back on it. And obviously someone with domain expertise should always review before anything goes into a real decision.

The AI shouldn't just generate a VRIO analysis from a text prompt; it should query a company's internal knowledge graph (financials, HR data, market intelligence). By combining CoT reasoning with verified data retrieval, the AI becomes a true 'company

brain' that provides deterministic, evidence-based strategic outputs rather than just high-quality text generation.

I think it is good for a first rudimentary draft that then needs human review and enhancement/adjustment, based on risk aversity/investment.

A major improvement would be a deeper prompt with search tool calling, whereby the analysis is enriched with past cases, either in the same industry or in related endeavors in other industries (as to a great extent, factors and environments are cyclical).

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