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Case Study of Skilful Use of LLM-Based Generative AI in Management of A Hypothetical Business

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ABSTRACT:
Now that generative AI technology products are already spreading worldwide and are improving their capabilities very fast, it is high time we examine what it can do to decision making, which is the essence of managing businesses. The present paper has used an innovative methodology where one of the currently available Large Language Model based product, namely ChatGPT, is given a series of questions/prompts to use its own capabilities to give its self-assessment of supporting the different dimensions of managing a business. Multiple conversations illustrated the need for well-structured prompts/questions to get the most out of ChatGPT, otherwise it can get confused and provide illogical response. The quality of mutual learning improves by constructive feedback between the human interlocutor and generative AI. Probing it further with multiple scenarios for a hypothetical mid-sized business has verified and confirmed those self-assessments. The insights and conclusions drawn from those conversations are that skillful use of the LLM-based generative AI products can assist human managers in making better quality decisions at all levels of management in a timely manner. Senior managers of businesses need to begin an effort to test-drive an available LLM-based generative AI product and plan to leverage it in the ongoing management to become a learning organization in the interest of the business.
"The disciplined practice of thoughtful questioning enables the scholar/student to examine ideas and be able to determine the validity of those ideas" SOCRATIC METHOD AS PER PLATO.

SECTION 1 – THE GENERATIVE AI LANDSCAPE:

The quest for creating an intelligent computer system has been going on for many years. In fact, Allan Turing (Ref 1) published a paper in 1950 to answer the question “Can machines think?” referring to digital computers. He defined a game, later called Turing test, where an interrogator asks questions to determine whether the responder is a human or a machine. In the same paper, given the state of technology at that time, he posits nine objections to the possibility of thinking machines, but tries to refute them.
Technology has since then evolved, turbo-driven, after G. E. Hinton in 2006 (Ref 2) came up with the concept of deep learning and backward propagation, with new models and techniques for machine learning, natural language processing, robotics and expert systems among others. All these developments, collectively called artificial intelligence (AI), have been entering subtly into day-to-day life and affecting many jobs for quite some time, but the announcement in 2022 by Open AI of ChatGPT

based on large language model that has been trained on billions of documents has got everyone's attention. It was discussed at the World Economic Forum in Davos, Switzerland for its impact on workplaces and on world economies (Ref 8). It is also being investigated by legislatures in the US and Europe on how to regulate it. That has created an urgency for all managers to gain insights into what transformations will be demanded in managing a business to take advantage of this technology.

Managing a business essentially involves making decisions on behalf of the business at strategic. tactical and operational levels. Herbert A. Simon (Ref 3) presented a model of how the behavioral characteristics of the decision maker influences all the steps of decision making, namely collecting information about alternatives appropriate for the decision, calculating or analyzing the payoffs for each alternative, and making a choice among the alternatives. So, the question to be investigated is to what extent current generative AI products can provide information/knowledge about alternatives for the enterprise, carry out the necessary analyses and capture human judgement of the decision maker in making the choice. And a follow on question is whether the generative AI products can be further trained to do that.

Results from several studies along those lines have already been published. Davenport and Alavi (Ref 4) present results on how generative AI products can be trained to use data specific to a business. Agrawal et al (Ref 5) describe how generative AI products can be trained by reinforced learning with human feedback to capture judgement of decision makers. Stadler and Reeves (Ref 6) report from their study that generative AI products, such as ChatGPT, are useful in idea generation for strategizing which may be useful to expert strategist, but they are not substitutes of a strategy expert. Training LLM based generative AI products for mathematics and quantitative analysis can be a challenge because math problems must be stated in text which is not easy. However, progress in that direction is being made in generative AI products based on other models and are reported by Castelvecci (Ref 7) on being able to solve some geometry problems. In short, even though today's generative AI products do not fully support all parts of decision making required in managing a business, new developments are certainly pushing it in that direction.

All new technologies get used for good positive results and are also for nefarious activities. Generative AI is no exception. The feared negative consequences of generative AI, e.g. "deepfakes", interference in political process, possible misuse for violent criminal activities, are well documented. We trust that solutions for these negatives consequences will be found through the regulatory systems for generative AI that are rapidly being established and hence are not pursued further in this paper.

Many enterprises are attempting to see how generative AI products can be trained/modified to fit their enterprises. That requires substantial resources and hence only large enterprises with deep pockets can initiate such efforts. However, all enterprises carry the risk of not investigating what generative AI tools can do for the enterprise. So far management practices have emphasized data analytics, but now generative AI provides a new set of tools for better management decision making in the interest of business success. One useful way to achieve that, as presented in this paper, is to have conversations with a generative AI product to develop new insights on what transformations will be relevant in business management.

Using ChatGPT (version 3.5 with memory of prompts/responses within a conversation) as a good example of the current state of generative AI technology, the authors followed the Socratic approach of having unstructured conversations of prompts and responses with it to get insights into its capabilities on various aspects of introduction of generative AI into management of a business. (The full transcripts of

the conversations, being quite voluminous, are available in Ref 10 and only relevant extracts are included in the text of this interdisciplinary paper.) Prompts/questions and responses from the unstructured conversation were analyzed to derive collective insights about what, in general, ChatGPT has and does not have in helping management decision making and those are given in Section 2. Section 3 digs further to determine the potential of ChatGPT for assisting a hypothetical company and leading to a sample of important decisions in the hypothetical company at strategic, tactical well as operational levels of management that were impacted by the collaborative conversations with AI along with the evidence for an altered decision based on advice from the AI collaborator. Section 4 provides authors' conclusions from those insights on how managers can get to know this important technology that will have a substantial impact on all businesses. Finally, in Section 5, the authors suggest an action plan for senior managers to leverage this important technology for improving their businesses.

SECTION 2 - INSIGHTS INTO CAPABILITES OF LLM-BASED ChatGPT

The immediate observation from the authors' conversations with ChatGPT is that it is good at natural language processing (in English) to understand correctly all the prompts and questions, even those written in somewhat colloquial phrases. However, it does not have knowledge that is generally known to humans, often referred to as "common sense". As a result, prompts/questions that are not well structured and are not complete in presenting their full context, ChatGPT responds illogically. (For example, in a non-business conversation about relationships within a family, ChatGPT did not know that a parent is always older than his/her child.) It does not have the capability to know when information is missing from the context, or the prompt/question is not logical, and to seek further clarification before responding. So, the very first insight is that to get the most out of the vast knowledge stored in ChatGPT the user must make sure that the prompts/questions are well structured, complete, and logical.

It certainly knows about the Turing test, the types of questions to ask for the different dimensions of the test, and it is honest about its capabilities in meeting only a few parts of the Turing test. ChatGPT's self-assessment on this topic is reproduced in Table 1.

Table 1 – ChatGPT's self-assessment for the Turing test

Dimension	Related question to ask	ChatGPT's self-assessment
General knowledge	Can you tell me who the current president is?	Has access to a vast amount of general knowledge up to its last training cut-off in September 2021, and can provide accurate information on a wide range of topics.
Reasoning	How would you plan a vacation to a destination you've never been to?	Has basic reasoning and can generate responses that simulate logical thinking, though it may struggle with complex or nuanced scenarios.
Emotional understanding	Describe a time when you felt very happy or sad.	Lacks genuine emotions and may not always produce responses that truly reflect an understanding of emotions.
Creativity	Write a short poem or a creative piece on the theme of 'freedom.	Can demonstrate creativity to some extent, generating novel and

		imaginative responses, though it may not consistently produce highly creative outputs.
Problem solving	Explain a complex concept, such as how a jet engine works, in simple terms.	Can provide solutions to straightforward problems and explain concepts, but its problem-solving abilities are limited compared to human expertise in specific domains.
Ambiguity handling	What would you do if you found an abandoned suitcase in a public place?	Might struggle with ambiguous situations and may not always ask clarifying questions to resolve uncertainties.
Personal experience	Share an interesting story from your childhood.	Does not have personal experiences.
Humor	Tell me a joke or a funny story.	Can attempt humor, generating jokes or funny responses, but the quality and context-sensitivity of its humor may vary.
Opinion	What's your stance on a controversial topic like climate change?	Can express opinions based on the patterns it learned during training.
Language understanding	Explain the meaning of a proverb or idiom, like 'the early bird catches the worm.	Has a good general understanding of language and can handle a variety of language tasks, though it may struggle with nuanced or highly context-dependent language use.

In short, it assessed itself as being good only at general knowledge and reasoning; limited at creativity, problem solving, humor, opinion and language understanding; and absent in emotional understanding, ambiguity, and personal experience. To verify its self-assessment in general knowledge and reasoning, the authors had multiple conversations about a broad set of topics that are important in today's world and about their usefulness in management of business in general.

It certainly has been trained on a very broad spectrum of topics, and is able to provide that knowledge in logical, concise form. It was prompted to gauge the extent of its knowledge about economies, climate change, emerging economies, and possible impact of generative AI on jobs and economies in general. The responses indicated that it is well trained on these general topics and also knows the limits of its knowledge. It mentioned that generative AI technologies have the potential to automate many tasks that are currently performed by humans in sectors such as manufacturing, transportation, and data entry. However, it noted that generative AI technologies also have the potential to create new job opportunities in fields such as data analysis and machine learning. It is honest enough to admit that determining the impact of generative AI on the economy is complex and multi-faceted, and it will require careful analysis and policy responses. To the question whether and how the changes in external environment will affect the national growth agenda of emerging economies like India, it cleverly dodged the question by saying that the impact of external changes on India's growth agenda will depend on how well the

country is able to adapt and respond to the changing global landscape. It clearly stays within the knowledge it has been trained for and does not venture to extrapolate it.

Quizzing it about the effectiveness of using generative AI for managing a business, it was able to give logical but generic responses, and gave practical suggestions on other considerations that ought to be in place to get the benefits. It clearly articulated the scope, costs and benefits of using generative AI of management at the strategic. tactical and operational levels. It was asked to analyze the payoff from using generative AI, but it provided only qualitative perspectives. At the same time, it provided a complete list of impacts/implications of a business not adopting generative AI. It also gave specific suggestions for management to cope with the disruptive challenges involving overhaul of business processes by using generative AI. It was honest about the biases built into its knowledge from its training data. It provided useful but general suggestions to overcome such biases and "hallucinations". Of course, it could not help in managing a specific business because it has not been trained with its own sources of information. However, it provided useful leads of sources to get top talent to get the most out of using generative AI in managing the business.

In human decision making in organizations, reasoning plays a key role. This helps in ensuring that decisions taken are rational and solutions to business problems are found efficiently.

Use of natural language and reasoning can involve various types of reasoning besides the most common form called "sequential reasoning", such as deductive reasoning, inductive reasoning, creation of hypothesis, seeking analogies, probabilistic reasoning, and use of tables, graphs and images for reasoning about spatial relationships, configurations, and transformations. These types of reasoning are often used in combination to solve complex problems, make decisions, and communicate effectively in natural language. Based on several conversations that the authors have had with Chat GPT, we believe that at the present stage of development AI programs can recognize the above reasoning arguments if presented skillfully in natural English by a human as part of the context statement. However, the responses are invariably playing "catch up" with human abilities and do not indicate more than an average reasoning capability of AI itself. On the other hand, the ability of AI to use inductive reasoning to extract key concepts as summaries of long conversations is at a level that can match best human capabilities.

The mode of reasoning that is best in any given context needs to be carefully selected by the human interlocutor and used to prompt the AI program. As the problem being posed gets more complex, this becomes increasingly important. When skillfully prompted, Chat GPT 3.5 is able to relate to many problems requiring more advanced second order logic and even Modal logic. This makes it feasible for the collaborative process to be taken to the stage where an algorithm for the solution is developed and taken further to generate a computer code in a programming language like Python with no need for an expert programmer.

Specifically, by posing the problem as a Constraint Satisfaction problem (CSP), efficient algorithms can be developed for a number of business situations like resource allocation and scheduling, strategic planning and decision making, business simulation modeling, personalized customer recommendations and also medical decision making for key persons.

The present generation of AI programs have made tremendous strides in achieving high level of learning, as per the biologically inspired paradigm, based on skillful prompts/questions fed to it by a human. (The other being logic inspired paradigm from Geoffrey Hinton Romanes lecture at Oxford University (Ref 20).) This is at a speed which is orders of magnitude faster than natural human learning.

The input can consist of information and existing knowledge and the output from such conversations gets back to the human with enhanced level of conceptual understanding from each conversation. This creates an opportunity of reinforced learning through cycles of feedback from the AI program to the human interlocutor. The key to this type of rapid learning is the skillful use of logically consistent prompts by the human and in an organizational context in can create a perpetually learning organization using timely feedback from AI. It has been confirmed by a careful reading of the underlying theory of LLP that the technology can handle with ease logical complexity of First order (Ref 16) which appears to be more than adequate for business conversations and text (Ref 15, 17). In the experience of the authors of this paper, the semantics and syntax of the conversations can be effectively managed without any "hallucinations" or other issues with the AI program. Learning paradigm helps both the human and generative AI, with reasoning supplied by the human as a part of the context statements. This would be one of the practical ways to build the partnership between humans and AI in supporting organizational knowledge management activities as proposed in Jarrahi et al (Ref 21). Co-created knowledge, however, needs to be secured for the user company through appropriate legal agreement.

The conversations purposely did not get into investigating ChatGPT's ability to show human judgment, essential for management decision making, because that is known to be absent from the current state of the technology. The bottom line insight is that even though ChatGPT in its current state cannot match human judgement, it certainly can provide a helping hand in managing a business by giving useful knowledge to most well-structured prompts/questions and admit when something is beyond its training.
In summary, the strengths and weaknesses of generative AI in its present form for managing a business are as given in Table 2.

Table 2 – Authors' assessment of its capability

Dimension	Authors' overall assessment
Knowledge	Extensive for many domains but knowledge of an individual business must be contributed by the user company, and is not trained for knowledge generally known to humans called as "common sense".
Logical reasoning	Up to first order logic (and simpler cases of second order logic) for prompts that are logical and complete, struggles with ambiguous situations and does not ask clarifying questions to resolve ambiguities in the prompts.
Qualitative analysis	Good, based on the context provided by the user.
Quantitative analysis	Minimal
Judgment ability	None

Given this assessment, the authors drilled down further to understand its capabilities in more detail with multiple conversations on behalf of a hypothetical company by playing the role of managers at different levels facing scenarios that are common in the real world.

SECTION 3: INSIGHTS INTO USE OF GENERATIVE AI IN A HYPOTHETICAL COMPANY

It would have been possible to converse with ChatGPT about an existing business to see how it can be used in managing the business. But that would have involved presenting information about the business

that may be confidential and damaging to the business if broadcast through a published paper. So, the authors created a hypothetical company based on their extensive experience with multiple businesses they were associated with. That hypothetical company was used as a case study to see how generative AI can be used in the interest of management of that company.

The conversations with ChatGPT clearly showed how its enormous knowledge of management theories and practices can effectively support each step of the management decision making process as follows.

- Refine decision formulation given the decision context,
- Identify multiple alternatives based on known management practices (which can overcome any biases of the decision maker for preferred alternative),
- Provide pros and cons of each alternative (i.e., qualitative analysis) for evaluation of the utility of each alternative by the human decision maker (Wang/Lu/Yin Ref 11),
- Suggest a choice for the given decision context for selection by the human decision maker's judgment of risk-payoff tradeoffs (Wang/Lu/Yin Ref 11).

Decision making in a business is often categorized as strategic, tactical and operational, and each has its own characteristics as shown in Fig.1 and Fig 2. Strategic decisions, such as entering or exiting certain markets, are usually unstructured, requiring broad knowledge about external as well as internal conditions, are ad hoc and involve judgment by senior executives. Tactical decisions, such as deciding marketing plans, are semi-structured, requiring focused knowledge supported by data analytics and some level of human judgment. Operational decisions, such as restocking inventory, are structured requiring specific internal knowledge supported by data analytics with minimal human judgment.

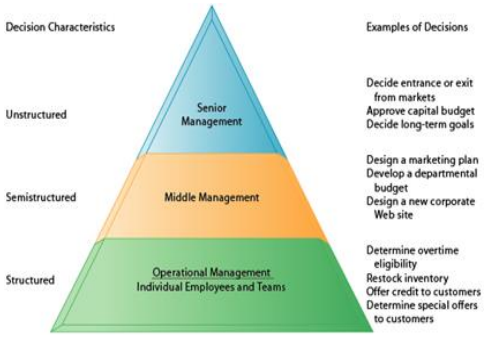

Fig 1. Levels of decision making

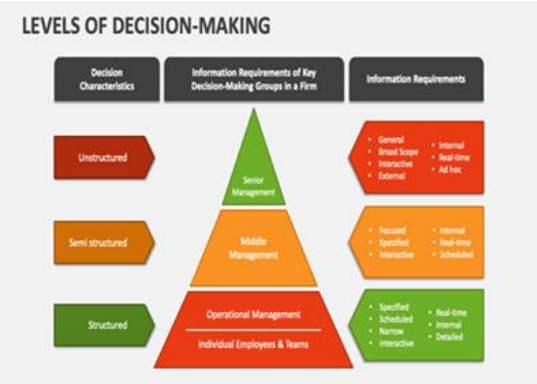

Fig 2. Information needed at different levels of decision making

The business context provided to ChatGPT was for a medium sized lubricant fluids manufacturing company which has a turnover at present in the auto ancillaries space of about USD 100 million per

year. The company has the franchise of a well-known international brand, and this has taken them to a present annual business of 20000 kilolitres per year in a highly competitive market.

Five unstructured conversations were generated with ChatGPT in which the authors played the following roles:

1. Chief Executive (Strategic level)
2. Director Human Resources (Tactical level)
3. Vice President R&D (Tactical level)
4. Junior Sales executive (Operative level)
5. Business analyst working with the CEO

One of the authors used his extensive experience in the oil and gas sector at all levels of management to play the five roles in forming the realistic scenarios and questions, and then to analyze/evaluate the responses for effectiveness in making the corresponding management decision.

SECTION 3.1 ROLE PLAY AS THE CEO

In the role play as the CEO, two conversations were carried out for making strategic decisions in two different scenarios.

In scenario 1, the CEO first described the context that she had her hands full coordinating various functions in her company such as R&D, Supply Chain, Marketing & Sales, whereas she wanted to free herself to work on growth opportunities. She was thinking of continuing the status quo but wanted advice from ChatGPT on two alternatives, namely setting up a cross-functional team of her present managers with authority to take all operational decisions or bring in an outsider as COO to take over this operational responsibility and report to her in the organization.

- ChatGPT responded that cross functional team "can be an effective way to distribute operational responsibilities and empower decision-making across various functions". It further added that she will have to "ensure that your present managers are equipped with the necessary skills, resources, and authority to effectively lead their respective functions and make informed decisions" and she will have to provide strategic leadership to "track key performance indicators, and provide support and resources as needed to ensure the successful execution of strategic initiatives".
- On the second alternative, it responded that "a COO can bring fresh perspectives, industry expertise, and operational experience to the organization, complementing the skills and capabilities of your existing management team." However, it cautioned that she would have to "ensure that there is alignment in values, culture, and leadership style between the COO and the rest of the organization to facilitate effective collaboration and integration."
- It summed up its advice with a decision criterion that "the most effective approach will depend on the specific dynamics, capabilities, and culture of your organization".

On further questioning, it provided empirical proof that "several studies have highlighted the benefits of promoting a learning culture and cross-functional collaboration within organizations", such as improved employee engagement and satisfaction, enhanced innovation and creativity, greater organizational agility and adaptability, enhanced knowledge transfer and retention, and positive organizational performance outcomes.

By adding her knowledge about the state of affairs in the company and her reading of her senior management team, the decision after conversation with AI was to actively encourage cross functional working in the company.

In scenario 2, the CEO described that the company was approached for confidential talks with ABC Inc on a possible takeover by them. ABC Inc has a strong R&D team, and they feel this will enable further expansion of her company's present portfolio of 500 products. They also think she has built a marketing and sales team that will help them strategize entry into new segments and geographies. The CEO asked ChatGPT for advice on open communication with her management team on the progress of the confidential takeover talks with ABC Inc., given that if the news of this leaks out to the press, it will upset the share value of her company in the stock exchange and compromise her position as CEO.

- ChatGPT provided a set of guiding principles for managing such communications, namely need-to-know basis, confidentiality agreements, clear communication guidelines, need-to-know updates, sensitive discussions in secure environments, mitigating information leakage risks, and contingency planning.
- It summed the pros and cons as "Ultimately, prioritizing confidentiality and discretion in managing the takeover talks will help protect the integrity of the negotiation process, preserve shareholder value, and safeguard your position as CEO. By fostering a culture of trust, professionalism, and respect for confidentiality within your organization, you can navigate sensitive discussions and strategic initiatives with confidence and integrity."

The decision after conversation with AI was for immediate communication while safeguarding confidentiality of talks. When prompted by the CEO, ChatGPT drafted a well-written confidential communication on the topic to her senior management team, and also an appropriate speech by the CEO to all the employees of the company.

SECTION 3.2 ROLE PLAY AS THE DIRECTOR OF HR

In the role play as the Director of HR of the hypothetical business, he had a conversation with ChatGPT when faced with deciding about the resignation by the business's VP for R&D.

In describing the decision context, ChatGPT was informed that the business has a list of key managers and staff in the company who will be very difficult to replace, VP for R&D being one of them. For obvious reasons, those employees have not been told their names being in that A list. This VP R&D has come to the Director of HR with a request to be allowed to resign after the mandatory one month notice period. An easy decision would have been for a rule-bound acceptance of the resignation. The Director of HR got into a conversation with ChatGPT about the decision.

a. When asked about ways to approach a discussion with the R&D VP, ChatGPT provided list useful suggestions for creating a supportive environment, encouraging the VP R&D to share his reasons for wanting to resign, discussing retention strategies, providing information and options such as

extended leave, sabbatical, or role reassignment, if feasible and appropriate, seeking a win-win solution, documenting the details of the discussion, and scheduling a follow-up meeting.

b. When ChatGPT was asked for alternatives for a win-win solution, ChatGPT suggested exploring motivations and concerns, acknowledging limited budget constraints, highlighting non-financial incentives, discussing mutual benefits and payoff matrices for him and for the business, exploring flexible work arrangements, and providing assurance and support.

In summing up the conversation, ChatGPT recommended creating a constructive dialogue that encourages the VP of R&D to reconsider his decision to resign and explore alternatives for staying with the company. Given that the VP R&D was a key manager difficult to replace, the decision after conversation with AI was to offer a retention bonus in advance. Based on this offer, V.P.-R&D decided to stay on in the company.

SECTION 3.3 ROLE PLAY AS THE VP FOR R&D

In the Role play as the VP R&D, the conversation started with describing the context of the decision on whether to change from an industrial segment where formulations are developed against performance specifications often on bespoke basis to a brand driven consumer business where there is possibility of offering a shorter list of approximately 30 formulations.

a. When asked about the changes that may be required in the tactical management of these two segments for sustained cost reduction, ChatGPT gave an extensive list of considerations for each segment.

- Industrial segment (bespoke formulations) requires optimizing formulation processes for customization vs. standardization, supplier negotiations and material sourcing, supply chain optimization, cost transparency and analysis, and customer relationship management.
- Consumer business (shorter list of formulations) requires standardization and simplification, brand management and marketing, product lifecycle management, cost-effective packaging and distribution, collecting consumer insights and feedback.
- It also added that adaptation, flexibility, and a customer-centric approach are key to success in both markets.

b. As a follow-up to that conversation, ChatGPT was informed that, as an example, the company has not been able to source a key raw material component ZDDP with a certain CAS number because there is a practice in top tier chemical companies to bundle it into high priced "additive packs". It was asked whether the company should take up a backward integration project for in-house manufacture of ZDDP. ChatGPT offered several potential benefits and considerations: control over supply chain, cost savings, quality control and customization, technology and expertise requirements, scale and economies of production, strategic partnerships and alliances, and risk management and contingency planning. The company must assess potential risks and challenges associated with in-house manufacturing, namely regulatory compliance, technology obsolescence, and market volatility. The company must develop contingency plans and risk mitigation strategies to address unforeseen challenges and ensure the resilience of your supply chain. It added that the decision to pursue backward integration for in-house manufacture of ZDDP should be based on a comprehensive analysis of the potential benefits, costs, risks, and strategic implications for your company's long-term competitiveness and sustainability in the lubricant fluids manufacturing industry.

c. A further follow-up conversation about potential risks of an alternative of sourcing ZDDP from a low-cost supplier in China, ChatGPT identified an exhaustive list: quality control and consistency, regulatory compliance, supply chain reliability, intellectual property protection, product testing and validation, effective communication and collaboration, and contingency planning and risk mitigation. It added that "by proactively addressing these risks and implementing robust quality control measures, your company can effectively manage the transition to sourcing ZDDP from China while safeguarding product performance, reputation, and customer satisfaction in the lubricant fluids manufacturing industry."

The decision of the company in this instance was to start sourcing of raw material components from China with appropriate technical safeguards on quality and product performance.

SECTION 3.4 ROLE PLAY AS THE JUNIOR SALES MANAGER

In the role play as a junior sales manager, the conversation consisted of the issues he was facing in providing sales forecasts of doubtful accuracy and the behavior of a customer's procurement manager. He gave information about his job as being allotted a district in a remote region of a developing country and given a sales target of 50 kilolitres of the company's lubricant products in the year 2024. He has to manage about 100 customer accounts in his territory with a portfolio of nearly 500 products of which 400 are specific to each customer. He has prioritized 20 key accounts which mostly order from his list of 30 fast moving products from ready inventory that he maintains at the company's depot which is 50 kms from his base. Orders for the remaining 470 products must be directly shipped from the company's factory which is 1000 kms away with lead times of 1 month or more.

a. When seeking advice from ChatGPT how to hold on to customers when their procurement officers are seen having lunch with competitor's salesman, ChatGPT suggested: building strong relationships by investing time in understanding his customers' needs, preferences, and pain points, offering value-added services, optimizing inventory management, streamlining order processing, communicating proactively, differentiating his products, providing incentives for repeat purchases and encouraging customer loyalty, and monitoring competitor activities. ChatGPT further suggested that while implementing those suggestions, the focus should be on customer satisfaction.
b. The junior sales manager had a separate conversation with ChatGPT where the scenario was that in the last week of every month, he had to give a forecast of the company's orders for the following month – customer-wise and product-wise - to help the company's supply chain department to replenish his product inventory at a minimum agreed level. Unfortunately, he goes wrong on these forecasts because of the abrupt cancellations of orders in favour of the competitors. Seeking advice from ChatGPT to improve this situation, ChatGPT suggested: regular communication with his customers throughout the month building strong relationships and understanding his customers' business, collecting data and using data analytics tools, collaborating closely with his customers, monitoring competitor activities, implement forecasting models, devising risk mitigation strategies, and continuously reviewing and learning from past forecasting errors and adjusting to enhance forecast accuracy over time.

The junior sales manager decided to implement these strategies that improved his sales forecast, and also developed closer relations with customers which improved customer retentions as well.

SECTION 3.5 ROLE PLAY AS THE BUSINESS ANALYST

In the role of a business analyst, who has been asked to investigate the pros and cons of the company switching its business model from B2B (for industrial customers) to B2C (for retail customers), she started a conversation to understand what she should be thinking of and factoring in her analysis.

a. When she asked about the risks in making such a switch, ChatGPT gave a thoughtful list of – channel conflicts, distribution challenges, brand perceptions, customer service demand, and market competition. It concluded that transitioning to a B2C model offers potential opportunities for revenue growth and market expansion, but it also entails inherent risks and challenges that must be carefully evaluated and managed to ensure successful execution and sustainable business outcomes.
b. Following up that response, when she asked about risks of large advertising expenditure in the B2C model, ChatGPT mentioned several risks, namely ROI uncertainty, budget overruns, market saturation, brand dilution, channel ineffectiveness, and the rise of ad-blocking technologies and consumer resistance to intrusive advertising. To mitigate these risks, companies should conduct thorough market research, audience segmentation, and campaign testing prior to committing large advertising expenditures.
c. Pursuing another aspect of B2C business model, she asked about financial risks of incurring high capital expenditure required for setting up a new blending plant to cater to the high production volumes for B2C business segment. ChatGPT listed upfront financing requirements, possibility of project cost overruns, market demand uncertainty, competitive pressures, and regulatory and environmental compliance requirements. To mitigate these financial risks, the company should conduct comprehensive feasibility studies, risk assessments, and financial analyses to assess the viability and potential returns of the blending plant investment.
d. Along the same vein, she asked about factors to be considered for starting with a pilot modular construction of the blending plant so that capacity is stepped up in line with increasing volume in B2C segment, ChatGPT listed advantages as scalability, speed of deployment, cost efficiency, flexibility and adaptability, and risk mitigation, while also listing challenges of infrastructure integration, quality assurance, long-term viability and environmental impact. When asked about combining pilot plant with trial marketing in a limited geography, ChatGPT mentioned several advantages of customer feedback and validation, market segmentation, risk mitigation, iterative learning and improvement. It concluded that adopting a modular construction approach for the blending plant offers a strategic solution for managing capacity expansion and addressing the dynamic demands of the B2C segment. Investing in a pilot plant also offers a strategic and systematic approach to gathering technical data, reducing risks, and optimizing the production process for successful scale-up to full-scale production.

This was a treasure-trove of knowledge for the business analyst to carry-out her responsibilities to develop a business plan for the CEO to switch from B2B to a B2C business model by adding knowledge specific to the company. In view of the CEO's vacillation between a "dominance" decision strategy as against a mere "satisficing" decision strategy (Ref 16), the representation of the case by the business analyst became critical. Using the principle of Prospect theory of Kahnemann (Ref 12), knowing the CEO's reference point on the topic, she made a presentation strongly favouring choice of B2C model as the dominant case with best balance of reward to risk. Based on her presentation, the company moved to the B2C model and became a dominant player in the lubricants business.

The business analyst pursued another conversation with ChatGPT about making the company a learning organization. In her task to come up with ideas/plans to change the company's working culture and become a learning organization, she sought advice from ChatGPT on different ways to achieve that.

a. When prompted, ChatGPT came up with strategies and considerations for fostering a culture of continuous learning and improvement: leadership commitment, empowerment and autonomy, promoting psychological safety for taking risks, recognizing and rewarding learning, investing in learning technologies, promoting learning from failures, embed learning to operational processes, measure and evaluate impact, and lead by example.
b. One potential source of knowledge would be conversations with the company's stakeholders, i.e., Employees, Suppliers, Bankers, Customers, Trade Associations and of course shareholders. When asked about leveraging ChatGPT to gather insights from such conversations, it provided a framework to organize such an endeavor: identify key themes and topics, categorize insights by stakeholder groups, create knowledge maps or conceptual frameworks, apply text analytics, prioritize insights and actionable recommendations, establish feedback loops and continuous learning mechanisms, integrate insights into decision-making processes, and monitor and measure impact. That way, the company can harness the collective wisdom of its diverse stakeholder community to drive informed decision-making, foster innovation, and enhance organizational effectiveness and resilience.
c. When asked if it may be possible to create a model for any rational conversation between a human and Chat GPT to co-create new knowledge, ChatGPT assessed that as a possibility for: knowledge integration and synthesis. mutual learning and exchange, iterative process of knowledge creation and exchange that evolve over time, leading to enhanced decision making and problem solving.

The business analyst concluded that ChatGPT could be useful for individual staff and managers to carry out their responsibilities, and that the interactions between humans and ChatGPT could also be leveraged for the company to become a learning organization. This would be in line with the strategic objective of changing the working culture of the company to a more professional one.

SECTION 4: CONCLUSIONS

Kahneman (Ref 12) referred to the two ways humans think as system 1 that operates automatically and quickly (thinking fast), and system 2 that allocates attention to the needed mental activities (thinking slow). Human decision makers tend to gravitate towards system 1 that is often intuitive and clouded by biases. Milkman, Chugh and Bazerman (Ref 13) argue that decisions made by system 1 alone can be costly and that there is little understanding for how to help people overcome their many biases. They further say that the time has come to search for strategies to move from intuitively compelling System 1 thinking to more deliberative System 2 thinking. The method described in this paper and the results from it for a hypothetical business show how a rational analysis supplied by generative AI can achieve that objective timely and effectively.

Even though ChatGPT is one product using Large Language Model of generative AI, with others already available and many under development, the insights from authors' conversation with it clearly shows the strength of LLM based generative AI in its ability to generate a rationally presented analysis to the human manager in timely fashion. Using the generative AI output by the human manager can vastly improve the quality and speed of decisions in business. The key to this approach is the synergy between

the human and generative AI with each contributing what they are respectively good at. With the rapidly evolving mathematical reasoning capability of generative AI, it may be shortly possible for generative AI to compute payoff matrices for alternatives for a decision, as per Herbert Simon's model (Ref 3), and thus increase its utility to a human manager for better business decisions.

The human strengths in business decision making are 1) ability to relate to the context of conversations better than generative AI and 2) ability to judge the likely behavior of other humans. At the present stage of evolution of generative AI, human managers will remain in control of the business decisions and can use generative AI as a very effective tool to enhance the quality of decisions for business competitiveness. Many organizations today are unprepared to react or act to see how generative AI can help them in adopting it for increased competitiveness. Managers need to investigate urgently its capabilities, and the method and results presented in this paper could be an excellent way to achieve that. Given the high rate of development in generative AI technologies, fast action is of utmost importance.

Our case study conversations in the hypothetical company confirm that making such a powerful tool available to staff and managers can lead the business to Peter Senge's vision (Ref 9) of a learning organization of people who are continually enhancing their capabilities and insights for improved quality and speed of decisions at all levels of management much faster compared to depending only on field experience. Ref 14 reaches the same conclusion that generative AI may revolutionize organizational learning.

The insights in the present article are broadly in the same direction as Ref 18. However, there is a considerable amount of practically useful experience that we have presented on the skillful use of AI in a hypothetical business organization that has been created based on the business management experience of one of the authors in a manufacturing industry.

In the case of Chat GPT, based on the conversations reported here as well as several other conversations we have participated in, it is recommended that the disciplined human interlocutor uses the version of English which has been published as SBVR (Semantics of Business Vocabulary and Business Rules (Ref 17)).

LLM-based generative AI are already able to provide effective support to managers as a "on-call" consultant. The upcoming developments and the possibility of custom-training them for business specific knowledge are moving them towards becoming a valuable collaborator. No wonder Microsoft has called its LLM based generative AI offering "Copilot".

The conclusions cannot be complete without listing important precautions in getting the most out of conversing with LLM based generative AI.

1. In conversations with AI, it is very important to set the context in each prompt/question. AI is currently totally dependent on the human interlocutor to provide this.
2. Do not allow yourself to make logically fallacious statements. This will need several clarifications before AI can respond rationally.
3. Use natural business English with grammatically correct sentences in the prompt statements. Clarity is very important in eliciting meaningful responses.
4. Challenge the AI program to distil out key concepts and summaries from a large amount of input information.
5. Proceed step by step in the conversation after fully absorbing AI's response to the previous prompt. Remember that you are yourself learning rapidly at each step.

6. If you refer to another human person in the conversation by name or designation, you should clarify your relationship with such a person and logical inference of this relationship.
7. For business conversations with AI, a multimodal capability is a must to read tables, graphs and images in the input. However, at the present stage of development of AI programs, it is advisable to take output only in natural language or computer code and avoid multi-media outputs particularly.
8. For business use of the knowledge generated through the conversations, it is essential to have a legal agreement with the vendor of the AI product that the intellectual property rights of the output revert to the client company and that the agreement for use of the AI program will safeguard company confidential information.
9. The user company needs to put in place a clear ethics policy separating use of AI for personal purposes from the conversations related to the employee's job responsibilities. This will help avoid any Conflict of interest situations.
10. AI in combination with internet and social media has created a huge opening for spreading disinformation or biases. Therefore, any information provided by the generative AI in a conversation should be verified before using it.

SECTION 5 –WAY FORWARD FOR DEPLOYMENT OF AI IN A BUSINESS ORGANIZATION

From a strategy perspective, it is no longer about which jobs humans do better vs which jobs machines do better. Generative AI seems to do better in systematic rational non-quantitative analysis. In time, generative AI will get more powerful in quantitative analysis too. The best decisions will be the ones where the human and generative AI collaborate and combine their respective strengths. In a learning environment in a company, generative AI can provide timely support to decision making in diverse front end functions like customer relations management, sourcing of inputs, staff appraisals and responsive product development among others. Top Managements at this stage should undertake intensive training in generative AI for all employees in the organization so that the jobs at all levels get enriched. The organization then becomes more productive and globally competitive through rational decision making at all levels of management particularly decisions being made on human interactions with the key stakeholders i.e. customers, suppliers, employees, communities/governments and trade associations and investors (Ref 19). Last but not the least, the company should get into an appropriate contract with the vendor of its chosen LLM-based generative AI product to protect the privacy of its confidential information that has to be included in the conversations to get most out of using that AI product.

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