ADEPTIA

Part 1

Understanding the Challenges and Nuances of Deploying Artificial Intelligence for Business

WHITE PAPER

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Introduction

Explore an in-depth analysis of the business constraints surrounding artificial intelligence (AI), revealing its limitations in operational efficacy, compromised precision, compliance, security vulnerabilities, and sustainability hurdles.

Businesses today are striving to gain a foothold in the AI-driven era. To keep ahead of the competition, many are integrating AI solutions into their existing business processes. A new survey indicates that a majority of IT leaders (67%) are prioritizing Generative AI for their business, with one-third (33%) naming it as a top priority. [1]

First, we should clarify how we are defining AI and the specific area of focus we want to explore. Artificial intelligence (AI) encompasses a diverse range of computational techniques emulating human cognitive abilities. It delves into the realms of learning, reasoning, problem-solving, and autonomous decision-making, and in some cases surpassing human capabilities in specific domains.

The AI landscape presents a broad range of subfields, each with distinct capabilities and objectives. Artificial Narrow Intelligence (ANI), the predominant paradigm, exemplifies “weak AI,” excelling in specific domains like facial recognition or spam filtering. Machine Learning (ML) underpins both ANI and the pursuit of broader intelligence, empowering algorithms to learn and adapt autonomously through data analysis. Deep Learning, a specialized ML technique, leverages artificial neural networks, mimicking the human brain’s structure, to excel in complex tasks like image recognition and natural language processing.

Recently, a new variant of AI has been garnering a lot of attention, that being Generative AI (GenAI). Generative AI is a vibrant branch of artificial intelligence focused on creating entirely new content. Generative AI (GenAI) exists not as a standalone subfield but rather as a fusion of established AI techniques. It draws upon the learning capabilities of machine learning, the power of deep learning

Introduction cont .

architectures, the understanding of language from Natural Language Processing (NLP), and the visual acumen of computer vision to craft entirely new content. This is a departure from traditional AI which typically analyzes or interacts with existing data. For this reason, we have chosen to focus on GenAI in this whitepaper and investigate the challenges and opportunities it presents to business.

The promise of Generative AI extends far beyond the horizons of traditional automation, offering the ability to redefine the very essence of productivity and support of the workplace. Businesses across the globe are awakening to the profound capabilities that Generative AI holds. Analysts and users alike are eager to harness its power, not merely as a tool but also as a collaborator that augments human intellect and creativity.



This burgeoning interest is founded on the tremendous momentum that Generative AI has inspired. Generative AI's unique capacity to create new text, images, and even code opens new doors to efficient and ingenious ways to innovate. It serves as a multiplier of human effort, enabling employees to focus on strategic tasks by offloading routine and repetitive activities to intelligent systems. AI is poised to revolutionize industries by facilitating the creation of novel designs, personalized customer experiences, and by providing deep insights drawn from complex data patterns. However, the integration of Generative AI into operational work presents unprecedented challenges. While the technology excels in enhancing human capabilities, its application in the day-to-day operations of businesses must be approached with strategic forethought. While AI can be a source for automation, it isn't a substitute for human roles and should be seen more as complementing and elevating the productivity of workers.

Limitations of Generative AI in Business Applications

The potential applications of Generative AI in business are vast, yet its current implementation faces significant limitations due to the disconnect between enterprise data ecosystems and AI model training methodologies:

1 NOT AN IDEAL FIT FOR OPERATIONAL TASKS

There's a growing eagerness among business users to incorporate AI to improve their workflows. Business users leverage these solutions to not only unlock novel use cases but also to automate, scale, and improve existing ones. These AI solutions are expected to substantially increase productivity. However, the reality is often different, particularly when it comes to operational tasks. Generative AI models or Large Language Models (LLM) require teams to have quite a range of technical expertise, from data architecture to mathematical expertise, to maintain and operate the model. Only when all these requirements are met, can Generative AI be beneficial to your specific application. Otherwise, AI solutions are more likely to create complexity and decrease the effectiveness of daily operational work.



"IT leaders are skeptical of the accuracy of Generative AI. Almost 59 percent find Generative AI outputs to be inaccurate and almost 63 percent agree there is bias in Generative AI outputs (e.g. misinformation)." [1]

2 LACK OF ACCURACY

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Enterprise data is often siloed, for example by application, data format or business operating units, and can be subject to stringent privacy regulations, resulting in data that is not readily accessible for integration with public AI models. This data, rich with industry-specific insights and business operations knowledge, is what AI models require to produce responses that are relevant and valuable to business users. Without access to this internal data, Generative AI models are limited to providing generic outputs that may not align with the business's specific needs or operational context.

Currently, Gen AI LLMs rely on synthetic internet data predominantly sourced from the public internet to generate responses. This presents a disconnect as these models remain unaware of the unique contexts, terminologies, and operational nuances specific to a business. In other words, the generated responses lack the specific data for individual businesses. Additional consideration should be given to the currency and or accuracy of the public internet data, both of which can contribute to imperfect training of LLM. For instance, the knowledge cutoff date for OpenAI ChatGPT 3.1 is limited to data up until September 2021.

Lastly, GenAI does exhibit a troubling phenomenon known as "hallucinations" where it can deliver largely inaccurate or totally false responses. Moreover, in the majority of cases, Generative AI provides solutions to specific, human-conditioned queries. Its narrow focus inhibits a broader understanding of the subtle nuances of human thoughts and behavior. Finally, Harvard Business Review states that future Generative solutions might train on their own outputs, resulting in a cycle of inbreeding that will bring about what they call an "AI echo chamber." Recent research indicates that training models based on data from Generative AI models give rise to a degenerative process – a phenomenon called "model collapse" – and it only takes a few generations for the outputs to become useless. [2]

3 POOR COMPLIANCE AND SECURITY

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Generative AI solutions fail to meet compliance requirements as per existing regulations and copyright laws. What's more, there's no verifiable data governance or protection assurances with regard to enterprise data. It's been suggested that users should assume that any type of data or query they enter into Generative AI solutions is likely to become public information. When data governance assurances are not implemented, companies should take proactive steps to prevent the unintentional exposure of their intellectual property, implementing controls and safeguards to ensure that the enterprise remains safe when Generative AI solutions are deployed. Finally, adding to the concerns is the fact that companies might need to prepare for malicious actors to use Generative AI for cyber and fraud attacks.



"A survey indicates that many IT leaders find Generative AI 'over-hyped,' with concerns that the technology brings the potential for security risks (79%)." [1]

4 WEAK SUSTAINABILITY

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Generative AI solutions can have a deep impact on a company's sustainability goals because they involve complexity and computational intensity, requiring large amounts of power during training and operation. As a solution, companies must adopt technologies that work to mitigate power consumption and optimize resource usage.

Risk Mitigation and Key Considerations for Generative AI Use Cases

To mitigate these limitations, businesses are exploring hybrid models that combine the generative capabilities of AI with rich, contextual data from their own repositories. This involves developing custom AI models or adapting existing ones to be trained on-premises with proprietary data. Such models are designed to be continuously updated with new data, ensuring that the AI remains attuned to the evolving business landscape and can provide insights that are both current and relevant.



Let’s consider a hypothetical example to illustrate the limitations of Generative AI in the context of enterprise data.

Imagine a multinational bank, "GlobalBank," that operates in more than 50 countries with unique financial products, services, and customer engagement strategies tailored to each region. GlobalBank wants to leverage a Generative AI model to assist in drafting personalized financial advice for its customers.

The Generative AI model, trained solely on public internet data, might understand general financial principles and the basics of customer service. However, when tasked with generating advice, it falls short. It might suggest investment strategies that don't align with the bank's products or fail to consider country-specific regulatory constraints. It could even recommend actions that conflict with the bank's internal risk management policies because it doesn't understand the bank's proprietary risk assessment models.

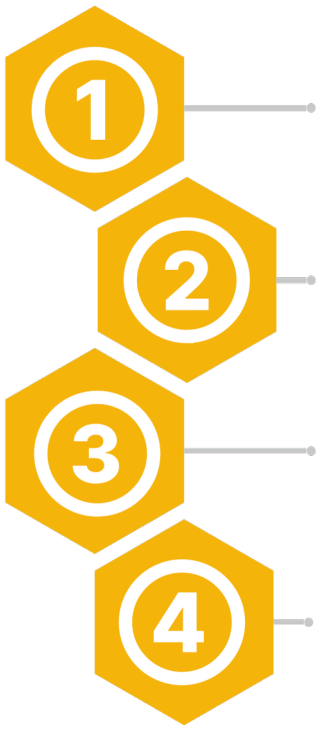
Now, let's envision that GlobalBank integrates its internal data into the AI's training process. The data includes historical customer interactions, product performance, regional compliance guidelines, and anonymized customer profiles. With this data, the AI can now generate advice that is not only relevant but also compliant with both GlobalBank's internal policies and regional regulations. It can tailor suggestions to align with the customer's specific history and the bank's overall strategic objectives.

For example, for a customer in Japan, the AI recognizes the preference for conservative investment options and suggests a portfolio that has historically performed well for similar profiles within that market. It does so by drawing on the internal data that reflects the bank's nuanced understanding of its customer base and the complex regulatory environment it operates.

This example underscores the limitations of using non-augmented Generative AI and demonstrates the transformational impact that integrating enterprise data can have. By combining AI capabilities with the rich context of GlobalBank's proprietary data, AI becomes a powerful tool for delivering personalized, strategic, and compliant business solutions.

Conclusion

In conclusion, while Generative AI presents a new frontier for business innovation, leveraging it effectively requires thoughtful integration with enterprise data. The ultimate goal is to create AI systems that are not only intelligent but also knowledgeable about the specific business they are designed to serve. As we proceed, we will delve into the practicalities of achieving this integration, its potential benefits, and the strategic advantages it can confer upon a business that successfully merges its data with the power of Generative AI.



Not an ideal fit for operational tasks

Lack of technical expertise, technology and data architecture impedes the effectiveness of daily operational work.

Lack of accuracy

Reliance on synthetic internet data that's algorithmically biased and inaccurate results in largely inaccurate and fabricated responses.

Poor compliance and security

Fall short of compliance with regulations and copyright laws, lacking robust data governance and protection assurances.

Weak sustainability

Impact sustainability goals as AI demands high computational intensity and significant power.

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About Adeptia

We empower businesses to Automate, Integrate and Observe data flows.

Adeptia began not as another integration solution provider but as a pioneer of AI-powered approaches to integrating businesses.

Since 2000, Adeptia's automated, AI and self-service-driven approach to integration has been helping clients around the world to integrate their businesses and partners securely, easily, and quickly. Our self-service integration solution is the only data integration technology available as a self-service business application that is designed for non-techie business users, enabling companies to transform how they do business and deliver the value they've promised to their customers. Adeptia serves hundreds of mid- and-large-sized businesses around the globe with easy-to-use self-service data integration that scales up to meet the production data volume demands needed by Global 2000 businesses.

To learn more how Adeptia software can help save your business money, visit www.adeptia.com



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Joanna is the Chief Marketing Officer of Adeptia, responsible for the company's marketing, business development, branding, strategic positioning, go-to-market strategy, and sales enablement.

Previously, Joanna was at SmartBear, a leading information technology company, where she served as Senior VP of Marketing. Before that, she was VP of Product Marketing at Sauce Labs, Senior Director of Product Marketing at Confluent, and Director of Product Marketing at Datameer, among other positions.

Over the past 25 years, Joanna has launched a variety of platforms and applications, from business-focused analytic applications to data-management tools, for both startup and Fortune Global 500 companies, including Confluent, IBM, and Oracle.

Joanna has a Bachelor's Degree in Chemical Engineering from the University of California, Los Angeles.



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