AI is a Tool of Last Resort

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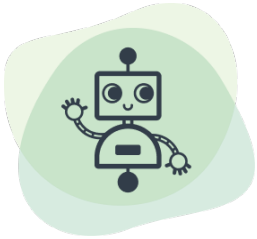
Introduction

Artificial Intelligence (AI) has garnered immense attention and investment in recent years, promising to revolutionize all aspects of business. However, indiscriminate application of AI to business problems, regardless of practicality, can introduce unnecessary solution complexity at higher than necessary costs. This white paper emphasizes that AI should be reserved only for select business cases when specific project factors are present. We point towards alternative methods and strategies that organizations should consider before resorting to AI, clarifying when simpler more traditional problem-solving approaches are better choices. We also advocate for a more strategic approach to AI deployment, positioning it as a tool of last resort, while clarifying the ideal problem features for AI and when simpler, more traditional problem-solving methods should be used.



AI is a Tool Not a Solution

The perception of AI as a universal solution to all problems leads to unrealistic expectations and costly failures.

For any business to realize AI's benefits, it is critical to see AI as an advanced tool for problem-solving rather than a solution in and of itself. AI shouldn't be treated as an end goal; rather, it's a technical tool to achieve specific business objectives that cannot otherwise be solved. Business leaders who want to leverage AI's potential to enhance decision-making, optimize processes, and uncover profitable insights from data need to take a more holistic view of what AI is, what is real costs are, and when it makes sense to deploy it.

The Costs of AI

From predictive analytics to recent deep learning innovations in natural language processing and computer vision, AI can solve a wide range of problems and automate complex tasks previously only doable by humans. However, the enthusiasm for AI's business potential can lead to ill-advised applications resulting in inefficiencies, excessive costs, and insufficient benefits.

A prevalent pitfall is the adoption of AI based on its promise rather than its practicality. Recognized as a breakthrough technology with the promise of addressing diverse business challenges, AI often entices organizations to hastily integrate it into their IT infrastructure without sufficient consideration of required processes, infrastructure, and resources. This leads to unanticipated impacts to the organization, operational processes, and costs—spanning development, execution, and ongoing maintenance— without realizing commensurate benefits. When these considerations are disregarded, the result can be an ill-informed AI powered decision-support process that hampers, rather than advances, overall business objectives.

Indeed, successful AI solutions bring with them financial and operational investments to produce measurable benefits, along with potentially problematic business risks, just as with any significant technical investment. Critical factors to consider when planning and implementing AI initiatives include:

- **Data Collection and Processing:** AI models rely on large amounts of high-quality data to create effective solutions. Gathering, cleaning, and managing this data can be a resource-intensive process.
- **Complex and Costly Development:** Building robust AI solutions, especially custom ones, requires a multi-disciplinary team with specialized expertise that can be expensive to acquire or hire. Typical AI teams consist of a machine learning or data science expert, a business application expert, and a data specialist at a minimum.
- **Ongoing Maintenance:** AI models require continuous monitoring and intermittent tuning or re-engineering, an often overlooked but necessary recurring cost.

- **Diminished Solution Clarity:** AI-based solutions are often "black-boxes" making their decision-making methods opaque which can complicate efforts to interpret or justify outcomes.
- **Ethical and Regulatory Considerations:** Deploying AI systems can involve addressing complex ethical and regulatory questions, which can entail legal costs and reputational risks.

Given these challenges, organizations must carefully evaluate if AI is the right approach for a given business problem, or whether alternative, less complex computational technologies can deliver adequate Return on Investment (ROI).

Simpler, Less Costly Alternatives to AI

Before applying AI to a given problem, organizations should carefully evaluate whether alternative, less complex solutions can adequately produce the required results.

> Everything should be made as simple as possible, but not simpler.
>
> - Albert Einstein

Techniques that warrant consideration and potential pilot testing prior to making substantial investments in AI approaches include:

- **Statistical Analysis & Data Visualization:** Elementary statistical analysis and data visualization can often reveal valuable insights from data without the need for sophisticated AI algorithms. This is especially relevant when the return on investment (ROI) is modest and there's a premium on result interpretability.
- **Conventional Search and Optimization Techniques:** For tasks such as resource allocation or scheduling, optimization methods like linear programming or integer programming are usually more efficient than AI. These techniques are not only less resource-intensive but are also readily available through specialized vendors catering to business challenges.
- **Robotic Process Automation (RPA):** RPA is beneficial when handling rule-based, repetitive, and structured tasks that involve interacting with various business systems and applications. It is particularly applicable when automating tasks where precise, rule-driven actions are required.

These techniques, among others, serve as the toolkit that organizations should initially explore when solving most business needs. They are not only well understood but are also more cost-effective, requiring fewer resources and less specialized skill sets to build and maintain. Moreover, they can enable solutions with sufficient ROI where other more complex technologies, like AI, would be prohibitive.

When AI is the Best Choice

Despite its costs and complexities, there are many business needs where AI is the best approach for addressing a business problem. Business problems with the following features tend to be good candidates:

- **Data is Abundant:** AI technologies require large amounts of example data to extract useful patterns that can be used to solve business problems. If your data is lacking, then so will the AI results.
- **Complexity is high:** If the problem's nature changes dynamically over time, or if the number of relevant features is large, or the problem factors are highly interactive, AI can be an effective tool to capture those complexities.
- **Traditional methods fall short:** While traditional technologies have significant advantages, they provide no value if they can't solve the problem. This is when AI as the tool of last resort is the best option.
- **ROI is clear and sufficient:** The Return on Investment (ROI) must be transparent and robust enough to warrant the associated AI costs and risks.

AI is not the answer to every question, but it is the best answer to specific, well-defined questions. When your business

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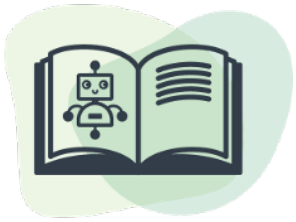
problem has abundant data, high complexity, lack of traditional solutions, and a sufficient ROI, then AI is a strong candidate for realizing that ROI.

Effective AI Solution Development

Deploying AI is not a trivial task and necessitates a structured approach to ensure the effective realization of its capabilities. There are four critical phases to consider for successful AI solution development.

- **Problem Assessment:** Organizations must clearly define the business problem they aim to solve through AI. This entails a methodical evaluation to verify the identified problem is a good candidate for AI, as described above. Of primary importance is an estimate of the ROI that the AI solution is expected to provide. This not only sets realistic expectations but also justifies the allocation of resources towards AI development.
- **Data Preparation:** Data is the lifeblood of any AI project. Therefore, meticulous data preparation is crucial. Organizations must ensure that the available data is both relevant to the problem at hand and quantitatively sufficient for effective AI training. Failing to meet these criteria could compromise the validity of the AI model and, by extension, the efficacy of the entire solution.
- **Build the Right Team:** The significance of having the appropriate mix of expertise for an AI project cannot be overstated. Successful AI deployment is a multidisciplinary endeavor requiring contributions from data scientists, domain experts, software engineers, and other stakeholders. Therefore, organizations must aim to assemble a team whose combined skills align perfectly with the project requirements.
- **Monitor and Improve:** AI is not a 'set and forget' solution. Business landscapes are dynamic, and so should be the AI solutions designed to operate within them. Continuous monitoring and ongoing maintenance are necessary to adapt AI solutions to changing business conditions. This ensures that the AI models remain accurate and relevant, thereby consistently delivering the predetermined ROI. Organizations must institute robust protocols for regular performance reviews and model adjustments to ensure long-term success.

AI solution development must be guided by a disciplined approach that prioritizes ROI and should only be employed when no other viable method can deliver the desired results efficiently. By acknowledging the cost, challenges, and caveats inherent in deploying AI solutions, organizations can successfully address their most challenging problems while avoiding unnecessary costs and complexity.



Conclusion

While AI holds undeniable promise for positively impacting a myriad of business processes and operations, it is essential to approach its application within a suitable process. The indiscriminate deployment of AI technologies, without due consideration for their practicality and cost-effectiveness, can result in unnecessary complexities and inflated operational costs.

AI should not be viewed as a universal solution for all business challenges. Rather, it should be considered a sophisticated tool, best reserved for problems where its application can be

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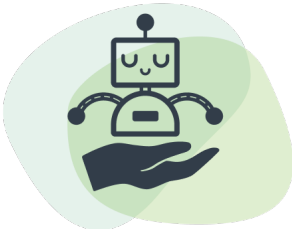
justified by a favorable Return on Investment (ROI). Organizations should conduct a rigorous problem assessment before resorting to the challenges of implementing AI. This includes careful scrutiny to differentiate from those cases where more traditional methods are apt and more cost-effective.



The successful implementation of AI in any business environment demands a balanced, ROI-driven strategy. By adhering to the structured approach and key considerations outlined here, organizations can make more informed decisions, leveraging AI's transformative potential whenever it serves as the most effective and economical solution.

How Ventera can Help

As an established leader in the technology consulting space, Ventera offers an unparalleled end-to-end service portfolio that covers everything from data collection and storage to infrastructure and AI solutions.

Leveraging over 25 years of IT expertise in both the commercial and government sectors, we possess the proficiency required to strategize, implement, or improve your data and AI operations.

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