



A Framework for Enterprise Artificial Intelligence Adoption

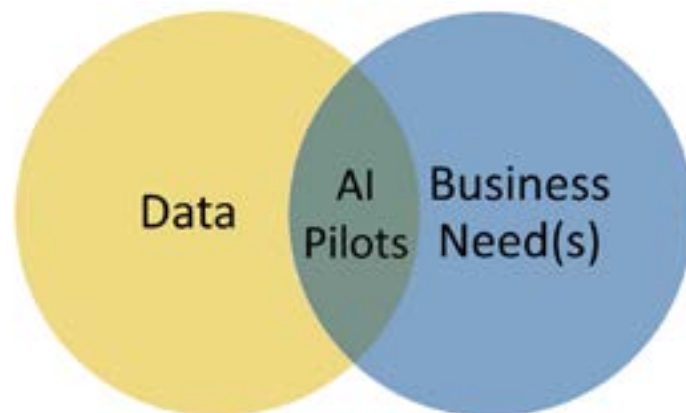
INTRODUCTION

Artificial Intelligence (AI) is no longer a technology of the future – its recent popularity and the prevalence of machine learning makes the adoption and implementation of AI capabilities possible. But how can your organization adopt AI in a meaningful way, at the enterprise level, to achieve measurable results? This white paper demonstrates our framework to help organizations adopt and implement AI pilots to solve complex business problems and data challenges that require sophisticated techniques.

A NOTIONAL FRAMEWORK FOR AI ADOPTION

Step 1 - Identify your organization's needs

The first step in this framework is to select a business need(s) to address that requires human inference or cognitive-heavy processes. Business problems that require a lot of human intervention and complex decision-making are good candidates. In addition to the business problem(s), you will need to collect available data that adequately represents the problem space (whether it be images, structured, or unstructured) that your organization has access to.





When examining potential problems, it is crucial your project focuses on a challenge your organization cares about to ensure you'll have impactful results. Organizational buy-in to AI is needed to scale from a pilot to a production-ready system.

Many business problems can be resolved using algorithms that leverage both Natural Language Processing (NLP) and computer vision. These widely adopted algorithms are mature enough for enterprise applications.

Examples of business needs that can be addressed via Natural Language Processing:

- **Answering questions and fulfilling requests** - Look for repeated conversations in your business workflow. Those are potential areas to augment with a chatbot.
- **Analyzing documents** - NLP can analyze documents to determine what the topics are and make the content easy to search based on context.
- **Updating records** - Voice and written inputs from customers can be updated automatically in the customer relationship management (CRM) system (e.g. Salesforce)

Examples of business needs that can be addressed via Computer Vision:

- **Automating data entry** - This enables you to make archived data or new data searchable and decrease backlogs.
- **Processing geospatial imagery** - Because it takes a significant amount of time for humans to review each image, computer vision is effective in scaling the analysis.
- **Analyzing video surveillance** - Algorithms can perform the initial screening and flag unusual objects, enabling reviewers to focus on high-value work and final determinations.

Step 2 - Start with small and meaningful outcomes

Once you identify the business needs that you want to tackle, it's important to define the scope of each pilot project. The scope needs to be well-defined, small in scale and should be technically feasible. By limiting the scope of a project and ensuring technical feasibility, this makes it easier to measure success and demonstrate impact quickly. The purpose of the pilot is to show the art of what's possible, increasing AI awareness and adoption in your organization. As stakeholders in your organization see AI capabilities in action through demos, pilots, and prototypes, your organization will better understand AI and its benefits. While it is tempting to aim for a large-scale solution immediately, a smaller and more meaningful project lowers potential risks while providing greater impact.

Step 3 - Use high-quality data in large quantities

Building a pilot that leverages AI requires high-quality data, in large quantities. High-quality data is considered data that is well-formatted and adequately represents a problem space – real data or synthetic data (to train the model) that represents the same structure and format as live data. Useful metadata and clear documentation will also help in the pilot implementation. Without a large amount of data or data sets that can adequately define an entire problem space, the AI algorithms that the pilot leverages will be difficult to build and evolve. The data's infrastructure also plays a role, enabling the pilot to retrieve the current data in a simple manner and access new data as it comes in. Prior investments in cloud infrastructure and data governance aid the efficiency of data retrieval and accelerate the pilot implementation. Organizations can also consider third-party data to augment proprietary data sets.

Step 4 - Explore different algorithms and techniques

AI algorithms differ from traditional software because developers spend more time evaluating the model than writing explicit instructions. For each of the pilot(s), the team must identify the inputs and outputs. Algorithms are selected based on the type of problems you are solving. Likely, the team will explore many different algorithms. Oftentimes, an ensemble of different methods performs the best. The data scientists must focus on manually curating, maintaining, massaging, cleaning and labeling datasets. The data is then used to optimize the model.

Scikit-learn, the open source Python machine learning library, has published a [flowchart](#) to decide which algorithms to try. Microsoft Azure also published a [cheatsheet](#) to help users to choose the right algorithm for a predictive analytics model. While these cheat sheets are not exhaustive of all the algorithms, they are useful when the team is starting exploration

We recommend only using open source technologies, both for the cost and the maturity. Most of the widely adopted AI programming libraries are supported by large tech companies. Proprietary solutions increase the risk of vendor lock-in, make it more difficult to find and retain top talent, and come with expensive licensing and maintenance costs.



Step 5 - Improve the models and curating the training data

AI models are constantly evolving as they encounter new data. To account for this evolution, you must budget time and resources in a project schedule to shepherd and continue iteration on the models. As you run the models in production, you will find gaps in your training data. Your team should amend the gaps in training data by collecting more training data for edge cases. Models can be optimized more real-world feedback is captured. The continuous optimization ensures that each pilot project move towards a favorable result.

GOING FOWARD

Your pilot projects will act as blueprints for enterprise-level adoption. Pilot projects are especially useful in learning the operational constraints of the organizations. With the goal organizational success, these pilot project(s) will act as a way to knowledge share how to work around operating constraints (e.g. data silos, data governance, data infrastructure, and CI/CD pipelines).

Adopting AI is an iterative process and each step described above should be repeated for each business challenge you are trying to solve. This approach will help your organization to better understand and implement AI to fit your organization's needs.

eGT's Applied Machine Learning Practice helps organizations implement any step of the AI Adoption Framework. We also design, implement, and deploy AI pilots for federal organizations. The topic of our next white paper will help you evaluate different technical solutions and techniques.

Have questions about implementing AI in your organization?
Email our AI experts at egtlabs@eglobaltech.com.