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data science team with the internal subject matter expertise needed to select and segment data sets, provide input, and establish targeted objectives.

At Intermedix, we encourage our business leaders to consider what results are worth guessing or predicting. From there, these leaders can work with data scientists and internal subject matter experts to determine if we have the necessary data to consider a valuable machine-learning strategy.

### CONDUCTING DUE DILIGENCE

Once it's determined that the necessary data is available, and a machine-learning approach may be appropriate, teams need to evaluate how AI capabilities should be applied, and decide what the desired end goal should be. To start, teams should ask themselves a few important questions.

For example, if 10 individuals at the organization perform the task that's meant to be improved by machine learning, would all 10 agree on what a positive outcome looks like? If all 10 disagree, then the business may need to consider what the expectation is for the AI implementation and how it can have the most meaningful impact on the business problem.

## Augmented intelligence: The better AI

Artificial intelligence (AI) is already everywhere in today's business landscape, and it doesn't always look like what science fiction portrays: Think more about Google search algorithms, customer experience by Amazon, or chatbots creating their own language at Facebook versus robots who have distinctive human features. AI and machine learning are creating a sizable niche in today's healthcare lexicon—so much so that having even a high-level understanding of what machine-learning algorithms do is becoming an increasingly valuable skill for anyone working in the healthcare industry.

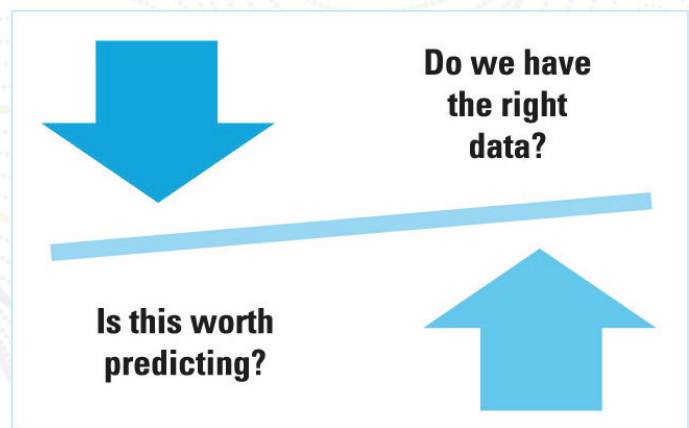
While many may assume that AI can quickly or automatically identify inefficiencies in business and solve problems independently, there is actually a significant human element that is needed for this technology to function most effectively. Many may also be surprised to know that non-data scientists or business stakeholders play an important and significant role in recognizing opportunities to apply machine learning. This article covers

the approach that the data science team at Intermedix uses to identify machine-learning opportunities across divisions for the improvement of end-to-end user experiences.

### GETTING STARTED

Business leaders and individuals without 'data' or 'analyst' in their titles typically have the best perspective of the bottlenecks, pain points, and strengths within a given organization. For this reason, division heads, team leads, and vice presidents are often well-positioned to identify business opportunities to

apply machine learning. Additionally, data scientists are largely ineffective when it comes to operating in a vacuum, which is why they oftentimes rely on business stakeholders to alert them of relevant problems that may present worthwhile ventures. Once an opportunity has been identified, it's the responsibility of the business leader to deploy adequate human capital to support the



**Figure 1:** The seesaw that businesses must balance when seeking a data science solution.

Another thing to take into consideration is how long have individuals at the organization been attempting the targeted task or something similar? Furthermore, it would be beneficial to look at whether or not thorough records have been saved that track strong outcomes related to this task. When looking for documentation, if records capture successful task outcomes that have been maintained over a suitable period of time, then the datasets can be used to help train a machine-learning algorithm to predict additional, unknown outcomes. If an accurate historical dataset doesn't exist, then the organization will need to start tracking and collecting this information. Even early data can be incorporated into a machine learning algorithm, along with the additional input and guidance from human insight, to train the algorithm over time.

Taking time to consider overall objectives and potential outcomes is important. Teams need to understand upfront that AI and machine-learning algorithms are only as good as the input data and feedback provided by the humans who are living and working in these various scenarios. In many cases, the best way to ensure that teams get the most out of AI implementations is by adding unique and invaluable human insight.

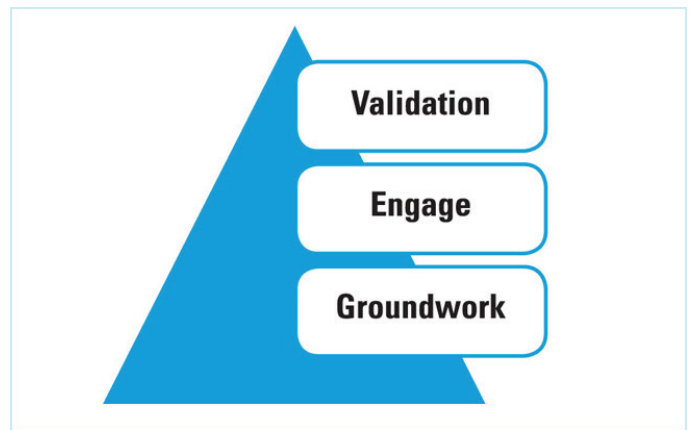
If the human logic within your organization is unable to reach a consensus on desired outcomes, then you need to go back to the drawing board and reassess. There needs to be an accepted majority vote outcome that can serve as the basis and foundation for building a machine learning model. Understanding that a deliberation phase needs to take place helps the organization move past the unfruitful experience of believing that AI and machines can make any decision without any context.

### LOOPING IN THE EXPERTS

After assessments from project contributors, organizational consensus, and historical datasets have been deliberated, it's time to loop in the data scientists. Data scientists may consist of either internal AI experts or third-party vendors, and can help determine if the project you're considering is feasible. It's crucial to schedule time to discuss the project at length with these data scientists and walk them through the needs, available datasets, and integral component considerations made, and the conclusions reached as a result. This input helps data scientists speculate if machine-learning automation is viable for your task and helps them flesh out which pieces of data involved in your target task are the most positive predictors of a rewarding outcome.

### EVALUATING BUSINESS IMPACT

After working with data scientists on the data logistics of the project, it's time to step back and reevaluate the project. For instance, an organization may need to consider any long-term changes and implications that will take place if the project and applied AI is successful. On a similar note, what will happen if the project is not a success? What kind of impact would this have on the organization? What if the algorithm only yields a positive outcome 65% of the time? An accuracy threshold is needed for the organization to execute the project securely and to the best of its ability, and ensure that this endeavor is the best use of time and resources before implementation begins.



**Figure 2:** The framework used by the Intermedix Data Science team to develop a data science solution.

### COMBINING SKILL SETS FOR EFFECTIVE OUTCOMES

One of the most challenging aspects of finding opportunities for machine learning and carrying out an AI-driven project is the need to shift preconceived notions of how traditional tasks are currently accomplished. It helps to remember that an algorithm can only reach its intended objective when the proper data and input are supplied by internal experts and historical datasets.

While this process can, at times, be arduous and involve a significant, progressive learning curve, once it's broken down, it all essentially starts with a stakeholder who is finding ways to address relevant problems within the organization. A culture of curiosity—combined with the right machine learning approach—can go a very long way toward building a competitive advantage at any organization.

Neither the subject matter experts nor the machines can be successful on their own. The overall goal of a machine-learning algorithm is to incorporate the many years of experience and insight into an algorithm that's able to build upon that established expertise and data and apply this knowledge to future tasks to increase productivity or create new value—thus supporting one another to create a better solution in the long run.