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Assessing AI in HRTech

Most companies don't understand the

math of machine learning & can't explain

the results

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> At [UNLEASH Vegas](#) this month, more or less every vendor claimed to be using AI, machine learning, data science, or any number of buzz terms. [Bill Boorman](#)'s panel "The Great debate - Practitioner versus Data Scientist" was an eye opener for me. Even machine learning practitioners are confusing terms in an attempt to paint what they've done in a useful, positive light. The HR practitioners have every right to being confused. Everyone tasked with making a buying decision about AI based HR Tech systems has fundamental questions. The answers seem more like hand waving combined with tech speak rather than concrete information HR practitioners can use to make the right decisions for their specific needs. In short, much of what's sold as machine learning is math the company doesn't understand producing results they can't explain. I've spent most of my career in machine learning building solutions for business; solutions customers will pay for because they add value. Most machine learning is a novelty used in freemium or ad supported apps. I've been forced to justify spend and measure ROI. I've used my background in business to help HR practitioners understand what AI actually is and how to weed out novelty AI from the truly transformational services. It starts with having a basic understanding of the different concepts that make up AI and then asking the right questions to discover which solutions are right for your business needs. As I believe

each of the questions I raise in italics.

What is AI?

AI is a term that's being thrown in a way that's confusing. There are a lot of sub terms like natural language processing, neural networks, deep learning, and algorithm which further obscure what's really going on. *Natural language processing* is teaching computers 3rd grade English. We teach them a vocabulary and reading comprehension. The vocabulary is built by letting the computer read millions of documents and learn how words and phrases are used to create meaning. The vocabulary along with other data, such as the job descriptions, resumes, prior matches/rejections, are fed into a *neural network*. That's a fancy term for a series of math equations that allow a computer to detect patterns in the data. Sometimes we also call this an algorithm and it means much the same thing although the terms are not interchangeable.

Deep learning refers to a larger set of different math equations that we combine to allow the computer to recognize very complex patterns. This is why we sometimes refer to the field as AI. Deep learning allows computers to complete tasks with a level of intelligence. Rather than programming rules, the machine has learned and can adapt that learning to novel situations that it hasn't

What is the machine learning to do? How much of that is programmed and how much of that is the result of machine learning?

A lot of what's called machine learning is mostly programmed rather than learned. Many systems are programmed to follow a specific set of steps for a number of scenarios. This is much like an intern. It comes with basic common sense that does an acceptable job with 80% of what it's asked to do but needs significant direction to handle the other 20%. That's time-consuming, which is why most companies don't pay their interns very well. Machine learning is characterized by a computer doing what it hasn't specifically been programmed to do. Machine learning systems have been taught to read a resume or job description like an expert recruiter. Terms that aren't specifically called out for searching are incorporated into the scoring algorithm. The system has learned what to look for so it can handle variations in language and content. A programmed system doesn't have the awareness to handle these variations so it cannot handle the same number of scenarios.

At Pocket Recruiter, our resume parsing engine is mostly programmed. We also use different learning techniques: Supervised learning techniques, when we have a complete view of the data, to guide the system's ability to score resumes. Scores are based on what we've learned from other resumes and job descriptions about what an ideal candidate resume is. Unsupervised learning is used to build our vocabulary. This is a machine learning technique used when the data is incomplete, for example when the text data we have requires additional context to be useful. All these techniques combined enable Pocket Recruiter to perform like an expert recruiter.

How much of the machine learning is purpose built and how much is open source based?

systems built on open source or openly available toolkits rarely perform as well in this field as purpose-built and trained machine learning products.

At Pocket Recruiter, we've built the machine learning behind the system from the ground up. We've intentionally avoided traditional vocabularies and natural language processing libraries because we found they do not work well for resumes and job descriptions. Most natural language processing is meant to work on text from news articles or other texts containing complete sentences. Job descriptions and resumes don't work that way. They are part lists and phrases, part complete sentences and paragraphs. Pocket Recruiter is designed to read these types of documents like a person would; gaining insights as a person would.

What data does the company use to train the machine learning model? Was it ethically sourced?

The Cambridge Analytica scandal revealed the cost of working with unethically sourced data. Solutions providers should be able to provide a clear source and pedigree document to explain their data.

At Pocket Recruiter, we have been transparent about our data gathering from day 1. We can provide a list of sources, all of which were created with the permission of any users involved. We've controlled the training data at every phase rather than having a third party slice it or label it for us. We're in the top tier of ethical data sourcing for machine learning.

How much time will it take to train the system before it's ready to use?

If a system isn't pre-trained, it may take months of effort to train before it's ready to use.

Pocket Recruiter comes pre-trained. The

improve based on user feedback. The user can select new qualifications, job functions, industries, and many more elements to guide the system or override the learning altogether. Based on selections and rejections, the system either validates or refutes its inferences (similar but not equal to conclusions) about an ideal candidate making small changes to scoring that better meet the user's specific needs.

How well does it perform versus a human?

Performance benchmarks and specific ROI metrics should be provided to show the system will meet the business need. This avoids systems which use AI for AI's sake.

Pocket Recruiter's clients see the impact of the system's machine learning immediately. In week one, Pocket Recruiter finds the same candidates an expert recruiter would in the first pass, reducing time spent reviewing resumes. In week 2, Pocket Recruiter finds previously undiscovered, high quality candidates. On average, the system saves 60% of the time spent sourcing and screening while improving the quality of the candidates put forward to interview.

How do you deal with bias in existing data sets (previous hires?)

Learning from biased data sets results in those biases creeping into which candidates are shown to the user and how those candidates are scored. It's important to ask, how is bias handled by the learning? Frequently, solutions providers will say, we de-bias the data set. While that's a start, who decides what bias is in the data set? How do they detect bias within the data? How do they detect bias that's not obvious to the user? Useful machine learning detects patterns which aren't obvious to people. That means it also pulls in biases that aren't obvious to people.

At Pocket Recruiter, we've chosen to base our machine learning on data sets that are

class data points.

The system shows candidates based on their qualifications for the job rather than how likely they are to be chosen by an individual; a hiring manager, recruiter, TA, etc. This unique approach results in candidates being shown to the user who would not normally appear in a result set due to selection bias.

Pocket Recruiter improves over time by taking user feedback such as selections, rejections, and how well the candidate progresses through the hiring process. To avoid introducing bias from hiring patterns, we use this feedback to either confirm or refute inferences the system has made rather using this data set as the basis for our initial training.

Can you specifically explain the results to ensure compliance with hiring regulations and best practices?

Machine learning that's a black box is risky from a compliance standpoint. The solution should make it clear how candidates were selected and decisions reached through the UI. Without this layer of transparency, meeting compliance requirements is difficult.

Pocket Recruiter's opportunity view is completely transparent. The user is shown which terms and phrases are used to make the determination of match score in both the job description and the resume. It is easy to show an auditor that no terms describing a protected class were used in the matching. The system is completely transparent at every stage of the process. As the system learns from feedback, learned terms and phrases are highlighted to show what the system has added to make match results more accurate. Additionally, a match record can be shared with applicants and prospects giving candidates specifics on how they fare. Candidates have the opportunity to question and challenge assumptions, something that is currently not a common practice but can go a long way towards improving candidate experience.

The questions above are the ones I would ask. If you have questions about AI, just send them to me and I will answer them. In the meantime, inspired by **Gerry Crispin**, we are creating a series of benchmarks for AI in HR Tech. These will be concrete, industry relevant KPIs to help support decisions about which system is right for your business needs. More to come.

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