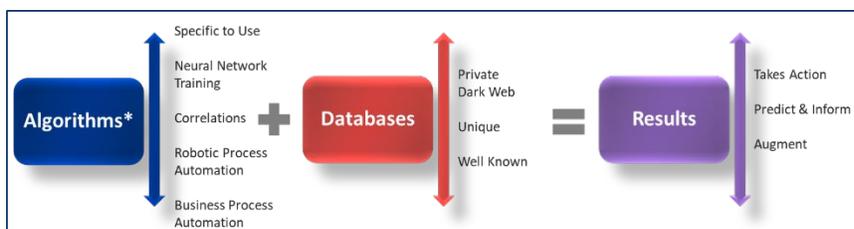


By John Cronin

**What is AI, and what does it have to do with IAM or IP?**

Artificial Intelligence (AI) goes back to the 1950's, as defined by Minsky & McCarthy, to be “any task performed by a program or a machine that, if a human carried out the same activity, we would say the human had to apply intelligence to accomplish the task”. This being the case, a lot has happened in almost 70 years since that statement. The history of AI can be easily researched; however, a reasonable definition can also be extracted from examples of how AI is being used and what AI is being used for.



As shown in the figure, AI needs to have algorithms, but they are likely not as complex as you think. A first form of AI algorithms can be as simple as software you

create to manage your business processes, called Business Process Automation (BPA). In fact, developing your business flow diagrams and committing aspects of it to software today is this form of AI. It seems that today companies are developing customized software to manage tedious or complex aspects of their business process.

Next, it's critical to understand the use of Robotic Process Automation (RPA). RPA is the use of software with some aspects of AI or machine learning capabilities to handle high-volume, repeatable tasks that previously required humans to perform. An example of this is software for a “web crawler” on specific certain web searches that can eliminate hundreds of hours of searching each time the same searches need to be conducted.

The figure further shows that algorithms can be more complex. The algorithm may use mathematical correlations, of which there are many (such as auto correlations, convolution, etc.) to find correlations of one variable to another. An example might be a first variable, of “time of day,” correlated to a second variable, “credit card items,” for potentially very interesting insights. Note that human beings can do this work, but a computer executing this algorithm and process is much more efficient.

Use of correlation algorithms may not be enough to accomplish the desired task, and solutions like machine learning (e.g. neural network training) can then be used. The neural network creates its own complex correlations if there is enough data to train the system to produce accurate results. For instance, an open source image processor such

as YOLO <sup>1</sup> (You Only Look Once) can be trained via a set of images of a certain breed of dog, to find the same breed of dog within a new image.

The next component in the figure, to understand is the database. There are well known databases that one can access that range from free databases like dictionaries, to a wide assortment of databases and libraries behind paywalls. Many of these have an API (Application Specific Interface), which enables a program to be written to easily extract data from a search.

Databases can be unique or even proprietary to your business. They could be an internal corpus of data, for instance, an internal database of non-disclosure agreements (NDAs), a collection of invention disclosures, or a proprietary competitive analysis. It is a new activity (and opportunity) for most companies to develop an API for their own databases, to make them more useful to any BPA or RPA project needs.

Databases can be specifically hidden from search engines but may still be accessible via software programs. In simple terms, the “Surface Web” is anything that a search engine can find within the internet, but the “Dark Web” or “Deep Web” are areas of the internet that a search engine can't find. The Dark Web includes databases like academic databases, which can be accessed through a normal browser but are not accessible to search engines.

Results of using algorithms and databases are also varied. AI software can be written to simply “enhance your BPA or RPA process, for instance, while typing a search phrase into a browser, one could build an AI process to track and count how many times that same search has been done in the company. The result helps to quantify the companies' degree of interest in the search. This information might augment your search, as searches like yours can be displayed, thus help to lead the searcher with historic company knowledge.

Results can be used to assess situations and anticipate outcomes, so an AI engine written on a BPA can be used to predict the relevant prior art you will need later, related to an invention disclosure. Also, the AI engine can be used to compare and warn whether the content of a document has some terms in common with the company's trade secret, to ensure nothing that is trade secret gets published.

Finally, the AI engine can suggest actions. In the context of Intellectual Asset Management (IAM), an “If This, Then That” (IFTT) rule program can be written to act on results, such as in the prior art example (If relevant prior art is found alert user) or the trade secret example (if trade secret language is discovered than alert user).

---

<sup>1</sup> <https://pjreddie.com/darknet/yolo/>

In those instances, inventing around the specific prior art may be suggested by the IFTT program; and an email warning or recommendation to not disclose the document may be suggested to keep the trade secret from leaking.

In another example, a IFTT program can be written to seek out and identify new product announcements through routine web searching, and then relate that information to a company's patent claims. The resulting action would be an automatically generated request for an "evidence of use" search.

### **Should I rely on large AI engines like Watson?**

Now that we have a bit of a grounding on AI, you might ask why a large generic AI engine like IBM's Watson wouldn't be applied to IP and IAM issues. The answer is simple.

Just because an AI engine is large and uses supercomputers to execute, doesn't mean (as is the case with all general-purpose computing) it will work for specific tasks. Watson lost a bid to do patent searching for examiners in the US Patent & Trademark Office (USPTO) to a small company in Israel. How could that be? The small Israeli company used a very specific corpus of data related to the job of an examiner to search more effectively, versus Watson, which likely wasn't "tuned" for the patent system. Keep in mind it took years to train Watson for Jeopardy, or to win games of chess or Go!

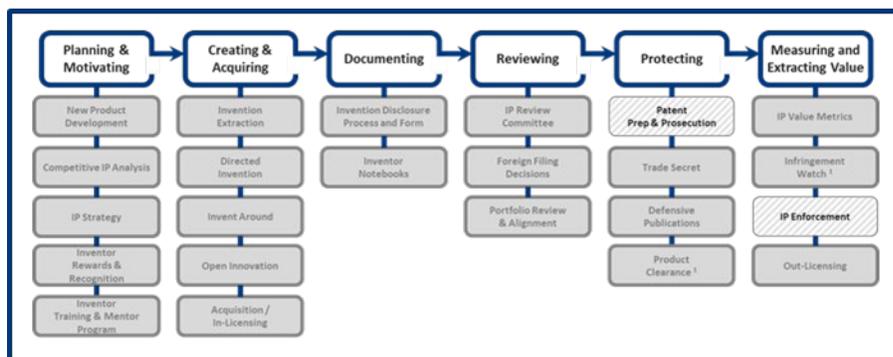


Source: [https://commons.wikimedia.org/wiki/File:IBM\\_Watson\\_w\\_Jeopardy.jpg](https://commons.wikimedia.org/wiki/File:IBM_Watson_w_Jeopardy.jpg)

Most executives that manage IP and IAM teams have not tried any AI solutions. We are aware of a few that have tried to use large AI engines for specific tasks and heard they have failed. They may not realize that the large AI engines are not tuned to the specific tasks they are attempting to execute. **Hence, "generic AI engines don't work", is the first reason that AI will enter the IP and IAM space as more as an App specific approach, where the AI engine is "tuned" to the job, as we are seeing that large generalized solution will not work.**

**I hadn't realized that my IP and IAM processes are so specific to me!**

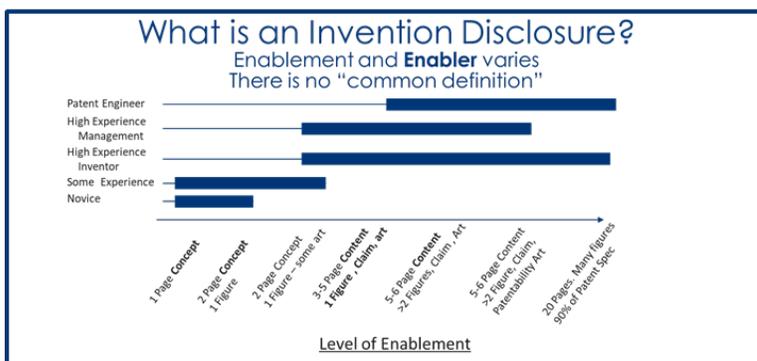
There are typically many processes for IP and IAM management within companies.



In some companies we have counted over 50 processes, but there are basic IP and IAM processes that are used by all. Many times, the IP or IAM processes are driven by the strategy chosen by the company. For

instance, a company that focuses on licensing will have internal processes for valuation, constructing IP stories, conducting evidence of use studies, etc., whereas a company that doesn't focus on licensing won't have those processes.

What was a bit of a discovery was that even for any given IP process - for instance, invention disclosures - each company, because of its unique strategy, history, culture, software capability etc., will exhibit a different invention disclosure process. For instance, one company may ask inventors to provide only a model's level of enablement in a disclosure, whereas other companies may require their inventors to write a very deep specification. One company may be focused on encouraging new inventors to document invention disclosures on their own, whereas another company may be structured to provide more senior staff with direct access to a patent engineer.



In an invention disclosure, not only is your level of enablement specific to you, but all sorts of other choices exist., such as:

- (1) Do you want inventors to write claims?
- (2) Do you need inventors to help formulate claims?
- (3) Do you require a lot of focus on defining the invention problem statement or not?
- (4) Do you need inventors to assess business value? If so, to what level?
- (5) Do you require specification on operability, and if so, how much?

- (6) Is there a need to have the inventors discuss how the invention fits the business landscape?
- (7) Do you want your invention disclosure customized to your type of inventor?
- (8) Do you want to have a high or low focus on prior art?
- (9) Do you want to distinguish the invention more from your own art?
- (10) Do you need a sizing of value by the inventor?
- (11) Do you want to write patent results more for licensing purposes, for freedom to operate, or for enforcement?
- (12) Do you prefer many embodiments included?
- (13) Do you want to track inventorship better?
- (14) Do you want good searches for related patents, and/or non-patent literature?
- (15) Do you want involvement of multiple team members to help improve enablement, etc.

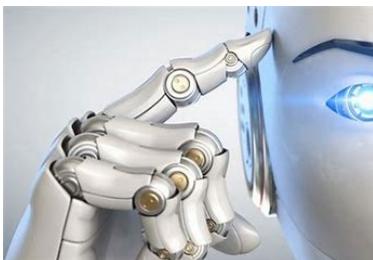
As we can see with just a single process for invention disclosures, of the fifty or so possible processes for IP and IAM, there are at least fifteen parameters that need to be addressed, and within those parameters of interest, ranges to align with company preferences.

***This certainly makes the case that to have a specific IAM process, your company should not be required to “fit into” a generic system. You are likely better off building your own AI apps for IP and IAM processes.***

### **So, is software development inexpensive?**

Multiple crowdsourced platforms of programmers are now available, with numbers of coders and their skill sets growing constantly (there are 900K programmers available in Top Coder for example). Given that these crowdsourced programmers can be compensated at variable and often low-cost rates by the job, yes, software development cost is no longer a major consideration to develop your own apps!

### **What kind of skills are needed to develop my own IP and IAM AI apps?**



The true skills in developing AI apps for IP and IAM include (1) a thorough understanding of IP or IAM processes, (2) the ability to conduct business process engineering, (3) the knowledge of what can be done using BPA, RPA or AI, (4) the ability to innovate ideas for AI software apps and (5) the skills to manage and get the job done, with software both piloted and installed. It would be ideal if all those skills exist within one group or at most two, for ease of integration.

**Aren't there a lot of companies working on AI for IP and IAM that I can use as an off-the-shelf solution?**

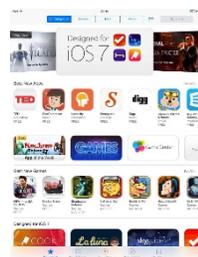
Recent analysis shows few, if any companies working on AI for IP and IAM that can be used off the shelf. Those few companies that do offer solutions appear to be struggling with the many issues discussed above, with respect to the uniqueness of each company's installation.

**Why wouldn't large IP and IAM workflow companies develop something I can use that attaches to their platform?**

It would have made sense for the large existing IP and IAM workflow companies to develop AI that could be used in conjunction with their platform. Interestingly, these offerings don't seem to exist? This is likely because of the need for a more customized "by user" App store approach. It is likely that, for an existing workflow, say a trade secret process, even though the large existing platform can store trade secrets the same format, the way to manage obtaining, rating and securing trade secrets would be different from one company to the next. This is not to say that new Apps couldn't attach to these larger platforms, rationally we believe they should! Apple intentionally developed their store as a platform, as they knew they couldn't invent and develop the many millions of ideas needed. It's unlikely that a large IP and IAM workflow company can cover all the unique applications that companies will want.

**So, AI enters the IP and IAM space as an app store?**

Yes, it appears that BPA, RPA and AI solutions will enter the IP and IAM space as an app store. Not only will this occur, we believe it will occur with ever-increasing speed. Getting on your AI journey will allow your company to benefit from lower cost implementation, and rapidly realize higher quality results. Like the time when websites became necessary for a business to succeed, and a legion of web programmers filled the void, there will be new skills that emerge, to fill the void in AI for IP and IAM needs.



**Apple and Android have an app store; who will have the app store for IP and IAM?**

It's likely that integration will occur through combinations of business models, first starting with the need to develop your own apps, like the way large companies developed their own legacy systems. Over time, we may start to see a GoDaddy approach in one process area such as invention disclosures, where some base capability is provided, and the company picks elements of customization, but this likely means many GoDaddy types of models will appear. Over time, as many companies progress on their AI journey for apps for IP and IAM, there's likely to be competition between open and closed source IP and IAM AI based apps, based on cost factors and competitive advantage. Some companies may have such a best-in-class set of AI apps for IP and IAM that it becomes a competitive advantage for them in the marketplace.

**Is there a way I can start on the "AI journey" for my company?**

Starting on your AI journey, as we have come to find out, is simpler than one might imagine. First, partnering with a firm that has the right skills as mentioned above, would be essential. But what is needed next is a common-sense way to start that journey with the right partner. First, work with the partner to understand the IP or IAM process for which you first want to develop an app. Next is to document the business process flow under consideration. By doing this, you collect data and understand both the "pain points" and "opportunities" for the new AI app. This is followed by innovating top improvements in areas of pain points or opportunities. The next step is to execute AI software development and then debug that software through an improvement process. It's highly suggested, since this is the start of your journey, to contrast the existing/previous process with the new AI app. This will not only demonstrate the effectiveness but serves as a pilot that can be used repeatedly to sweep through the organization to continue developing AI IP or IAM apps.

**Is AI for IP and IAM for large companies only?**

Because the cost is so low and the time for implementation is fast, there is no longer any specific market size, or technology domain focus for AI app development. That said, since time and cost savings begin immediately, many smaller companies appear to be embracing this AI IP or IAM app direction even more quickly than large companies.

**Do we need PhDs in AI, dozens of programmers, and many years to get AI working in IP /IAM?**

With total respect to this area of study, it would certainly be helpful to have a PhD on staff for AI support, but practically, real AI expertise at a PhD level is only needed for very complex assignments. Many of the AI engines for deep AI are open source and can be accessed and utilized by those with modest credentials in AI. The skills and activities mentioned above will likely constitute 95% of the staffing or hiring needs required.

**What's beyond the AI IP and IAM app store?**

Besides the normal integration of your new AI IP and/or IAM apps, the data that is collected will be used for true AI forecasting using the data, being able to predict and characterize future trends and opportunities. Speech interfaces are likely to replace most form-based entry where feasible, and speech notifications of flash reports or alerts will become common. RPA, BPA and AI engines are available to further enhance all varieties of user interactions and data visualizations. Just as in 2007 Apple's App Store began with 400 available apps. Imagine what will be available 1-2 years from now on your AI IP or IAM journey.



Finally, it is very likely that each IP or IAM worker will have direct connection to a programmer somewhere in the world that continues to customize the apps (perhaps through a chat box or window on their computer). With direct experience in this matter, the "Version 14" of an IP app developed appears to be almost magic, but the first Version 1 was totally rejected as unusable by many of the testers. One must have the attitude that success will be inevitable. In this example, Version 14 was only 6 months later than Version 1, and the cost of the evolving improvements was insignificant. AI will change the world of IP and IAM, and very quickly. The question is whether you will be part of the revolution or be left behind.

**It's time you get on your AI IP and IAM app store journey.**