

## 11 traits Great Data Scientists & Machine learning experts have in common

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So, you're planning on a switch to a career in Data Science? You've certainly made the right call. The jobs are there for the taking, the work is very interesting and demand has outstripped supply, which means that the pay is excellent, and is likely to remain so for the foreseeable future. This isn't just what the media says; it's actually true.

If you've spent the last few months tweaking your skills to suit the data sciences, perhaps by taking part in competitions, enrolling in online courses and working on projects in your spare time, you're probably reasonably confident in your skills.

But how do you ensure that you will be a success in the field? Is it just about knowing algorithms, linear algebra and probability? Probably not, right? Just as knowledge of programming is not necessarily the pathway to success in IT, it takes a few special qualities to make a success of yourself in machine learning.

In this article, we'll examine 10 traits that are necessary to excel in the field of machine learning.

### #1 Obsessed with solving problems, not new tools

Machine learning is a growing field with lots of new and exciting things happening all the time. It's easy to get mixed up in the hype. Perhaps you attend a lecture over the weekend or watch a talk and are desperate to try out the new tool, whether it's Tensor Flow's Object Detection API or Apple's Core ML. It can be pretty hard to shake off the temptation.

Experienced machine learning professions, however, are very well aware that such temptation can throw you off your actual goal, which is solving business problems. So, should the perfect opportunity come along to integrate a new library or language into a project, they would gladly include it. But they will not entertain force-fitting.

One reason this is so is that machine learning experts, working within data science teams, are very much businessmen, the same as business analysts. They're not coders or researchers. They just happen to practice business using programming, mathematical and statistical techniques.

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## **#2: Clear Understanding of what they're great at- domain, coding, maths?**

Data Science projects typically have an enormous size, involving various stages. Experts are very good at taking stock of it all and identifying where they would be of most value in the process. For example, at the ideation stage, excellent domain knowledge is required. We're talking about people who are very well aware of the various aspects of the project, and even how each of them influences each other. This isn't always the domain of data scientists. If we're dealing with a machine learning project involving stock market analysis, a person with a good background in finance would be ideal. Experts will always involve non-technical persons with the right kind of domain knowledge and allow them to define the problem, rather than do it themselves.

Similarly, there may be other stages of a project, where it would be better for an expert to defer to the judgement of a person with another skillset, such as an engineer, data analyst, even an operations officer.

## **#3: Keeping themselves updated with rapid developments in Machine Learning**

The machine learning field is fast evolving. Every few months, there's a new tool or a new way of thinking about a certain topic, algorithm or model. This can be pretty intimidating if you're not in love with the subject. Machine learning experts, though, are obsessed with the latest developments in the field and will spend a few hours every week on the topic, following trends on Reddit, reading websites like KD Nuggets and Kaggle. and much else.

This information guides them toward next steps in the field and keeps them ahead of the game. So much before a new technology goes mainstream, they're already clued into how it's going to be used. For example, four years ago Hadoop was alone the most popular framework, but then Spark shot up on popularity. Experts would have been aware of the development much earlier and made the decision to learn Spark at an early stage. Most experts, therefore, are continuous learners.

From 2006 to 2016 popular data scientist designations have grown from just "data or business analyst" to include data scientists, business analysts, big data specialists, machine learning specialists, data visualization experts and much more. This alone tracks the pace at which the landscape is changing and how a machine learning expert needs to be in synch with them.

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## **#4 Practical approach to solving problems**

For all its promise, machine learning isn't the solution to everything. Sometimes, it just cannot be used to solve a problem, whereas at other times it isn't the most optimal solution.

As a machine learning professional, you need to always take a practical approach at every step of the way. When a project comes your way, you need to evaluate if machine learning is the best way to solve it. If it isn't, don't be afraid to pass it up. There will always be other opportunities. Moreover, when a problem is better solved by rules-based programming, don't try to force a machine learning solution.

Instead, for every project that you undertake, set metrics for yourself. The right metrics will provide the right feedback on how your model is performing. Keep track of the additional revenue it is bringing in. Also keep track of the overall performance. Let's say you're in charge of a model that recommends new products to shoppers on an e-commerce site. Try maintaining a manual list of products your model does not yet understand and the ones that it does clearly. Every week, make sure to look at a random sample of data to see whether it's improving.

## **#5: Doing Data Science for business results not for sake of doing Data Science**

Data Scientists, particularly those with a background in academics, may take time to develop this trait, but it's an important one. All machine learning experts should be continuously focused on the reasons they are solving a problem and the value it will add to a business. Before beginning a project, the expert should ask, 'Will solving this problem yield better profits for the company?'.

During the project, he/she would ask, 'Is the time I am spending on this particular task worth the results it will deliver to the project as a whole?'. Once the project is delivered, questions related to improvements that can be brought (as well as how soon they can be delivered) are commonly asked and discussed by experts in the field.

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## **#6 Finding interesting problems to solve. Applying Data Science to new scenarios**

As an extension to the point above, top experts don't just do what they're told. It isn't as if CEOs or department heads inform the data science team what can be done. While that may happen surely, it's also the job of the team to inform the rest of the business how its decisions can be optimised with the use of data.

Therefore, data scientists are constantly mapping the actionable and meaningful insights they come up with to new scenarios. In doing so, the expert is reducing uncertainty in an area of business that was previously guided by a combination of intuition and analysis.

For example, a logistics company does millions of deliveries every single day. Machine learning experts can use data to help these companies decide shipping routes on a daily basis. In real-time, the company can tell its drivers which route to take and what order to schedule deliveries. This would be done by building a model using map data, delivery data, driver profile and much else. The same model could also be used to optimise pricing for each route; it could maybe also inform the business about which driver should be doing which route. Each of these insights could improve the profitability of the business. And it's all done with data.

## **#7 Exceptional communication skills to engage multiple stakeholders**

Now, this may seem like a pretty generic point, but we cannot stress enough just how important this skill is in the machine learning world. This is because, machine learning professionals must interact with people from various other fields. In fact, being an interdisciplinary field, you will be interacting with people from your team who do not fully understand your work (and vice versa). At the same time, the subject matter of the discussion can be pretty high level.

The ability to communicate complex matters to non-experts is highly important in this field. Machine learning experts can't work in a bubble. They have to be constantly in touch with stakeholders at every level. For example, let's say an e-commerce company wishes to build a product recommendation engine. The machine learning expert will have to explain data requirements to various stakeholders, gain domain knowledge by speaking to product managers and even speak to the chief information officer of the business to understand the requirement clearly. All of this requires exceptional communication skills to ensure that the right information is collected.

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## **#8 Data-driven with amazing storytelling ability**

Some people just have this skill, while others have to learn it. We're talking about the ability to weave stories with data. Whereas some will just state facts, others will build such an awesome visualisation that the insights just come alive.

A good machine learning professional needs to learn how to tell stories because visualisation is a key aspect of the job. Humans, after all, work better with visuals, than just numbers. The right visual is far more likely to yield insights. Relations between features that were unnoticeable in the data will be seen in the visualisations. Moreover, if you're working with data that needs to be visualised on a website (for example, an equity index), you need to ensure that the right data is visualised to keep the visitor engaged.

Finally, remember that you're working in a corporate setting, where the ability to tell a data story will always come in handy when selling a project to a superior.

## **#9: Best Data Scientists understand that Machine Learning is an iterative process.**

Machine learning projects can be optimised to no end. You could build something today that will forever be optimised. Take a fraud detection system as an example. PayPal introduced a machine learning solution for it 10 years ago. By today's standards, it would seem to be a primitive tool, given that it now uses deep learning techniques to solve the same problem. 10 years from now, the deep learning technique might be primitive because several improvements would have been made.

That's a really long-term example, of course. But, even if you take it a shorter time period, improvements can always be made. Machine learning experts are used to building iteratively. The first model is really simple, able to perform a task that might seem pointless. Over time, this model is developed and refined; data is explored and added, new features are added or removed, and much, much else. It's a mammoth task, and veterans in the field know that patience is required.

## **#10 Knowing when to stop**

You can always improve a model, given that it takes an iterative approach. If not today, perhaps two months from now, a new technique will emerge or come to your attention; if used in your model, it could give it a small boost.

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Should you do it? You will need to answer this question by examining the difference the improvement will make to your organisation. So, let's say, you've delivered a

solution to your sales team that enables them to tell, with 65% accuracy, the likelihood that a particular lead will convert. The new technique may take this number up slightly, but would also require you to invest a couple of weeks of your time, when you could be working on a more crucial solution.

What do you do then? Once you gain experience, you'll realise that you need not only to evaluate the opportunity cost of working on a particular improvement.

## **#11 Applying Structured thinking and envisioning all stages in the beginning**

As in all fields, experienced workers know exactly how to approach a problem. They set up a framework, mess around with the information on hand in a very crude manner, speak to their peers and estimate their requirements before getting started on a problem. By the time they get started with the data, they already know how they're going to push the project through to completion. They know the frameworks involved, the tools required, whose help they would need, how much time it would take, and much more.

A newbie, on the other hand, simply jumps into the data, without analysing whether the project is feasible or even if the approach is correct.

Experience brings structure to the whole process. Experts will be able to complete projects that take newbies six to eight months in a few weeks.

There you have it. By the time you master these 11 traits, you'll be a veteran in the field advising youngsters how to become more like you. We wish you all the best in your career!