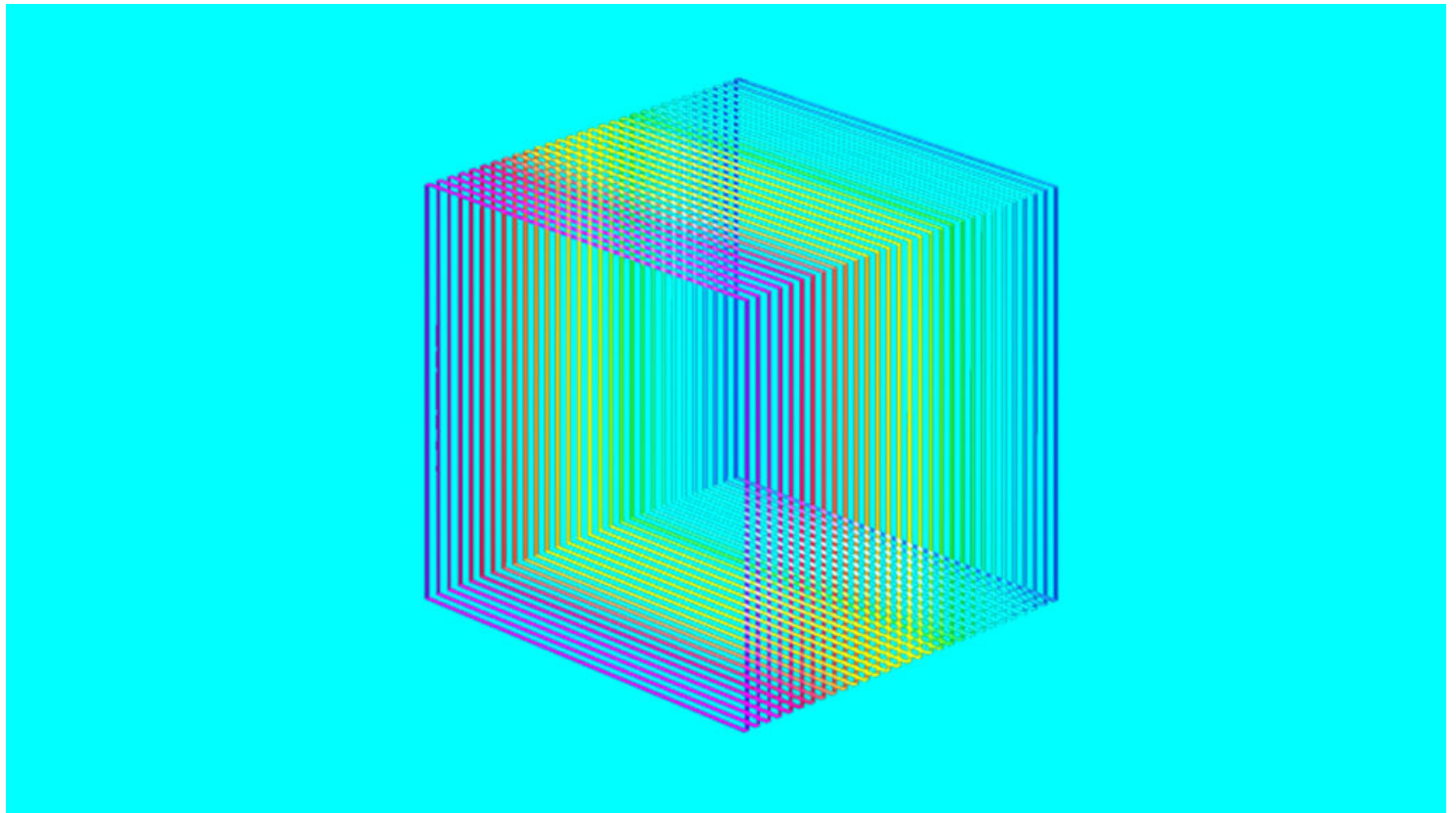


DEVELOPING EMPLOYEES

Prioritize Which Data Skills Your Company Needs with This 2×2 Matrix

by Chris Littlewood

OCTOBER 18, 2018 **UPDATED** OCTOBER 23, 2018

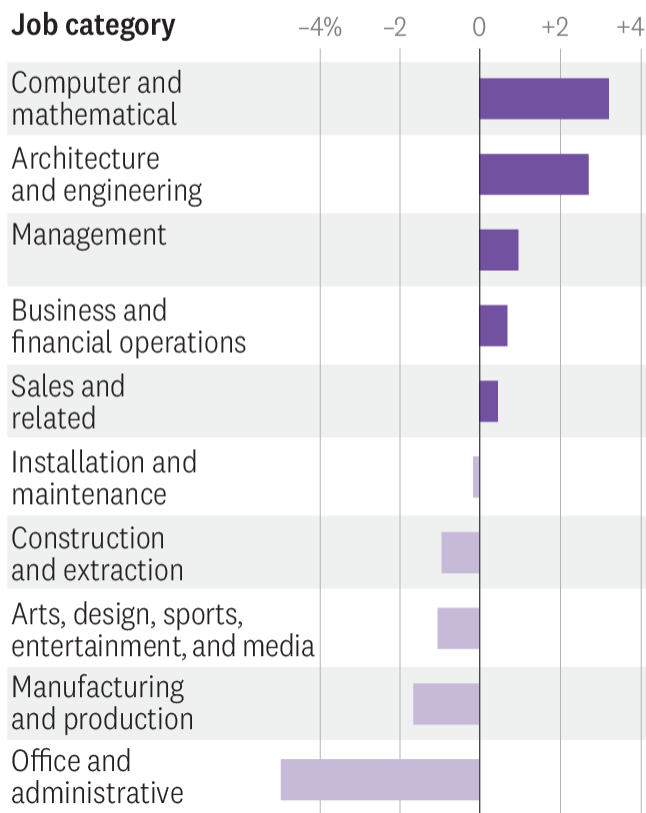


JORG GREUEL/GETTY IMAGES

Data skills – the skills to turn data into insight and action – are the driver of modern economies. According to the World Economic Forum, computing and mathematically-focused jobs are showing the strongest growth, at the expense of less quantitative roles.

Jobs Built on Data Skills Are Showing the Strongest Growth

Average compound employment annual growth rate %, 2015–2020



Source: World Economic Forum's "The Future of Jobs" survey, 2016

HBR

So whether it's to maximize the data we play in

data-driven economic growth, or simply to ensure that we and our teams remain relevant and employable, we need to think about transitioning to a more data-skewed skillset. But which skills should you focus on? Can most of us expect to keep pace with this trend ourselves, or would we be better off retreating to shrinking areas of the economy, leaving data skills to the specialists?

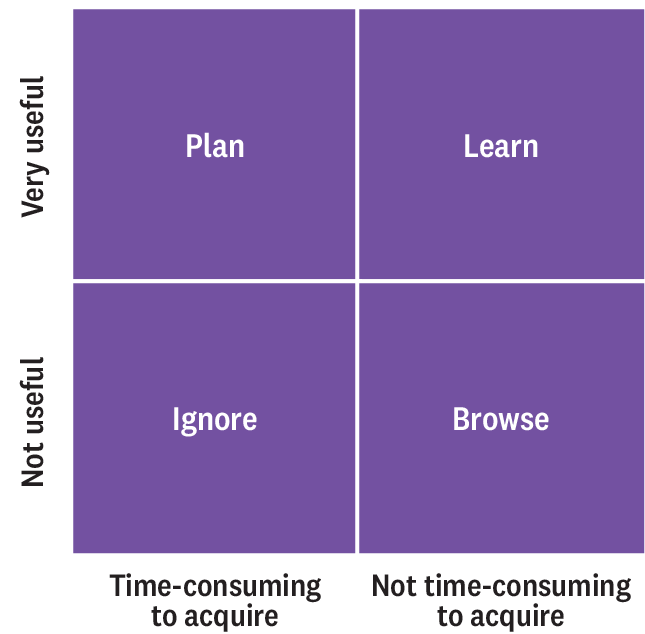
To help answer this question, we rebooted and adapted an approach we took to prioritizing Microsoft Excel skills according to the benefits and costs of acquiring them. We applied a time-utility analysis to the field of data skills. "Time" is time to learn – a proxy for the opportunity cost to you or your team of acquiring the skill. "Utility" is how much you're likely to need the skill, a proxy for the value it adds to the corporation, and your own career prospects.

Combine time and utility, and you get a simple 2×2 matrix with four quadrants:

- **Learn:** high utility, low time-to-learn. This is low hanging fruit that will add value for you and your team quickly.
- **Plan:** high utility, high time-to-learn. While this is valuable, acquiring this skill will mean prioritizing it ahead of other learning and activities. You need to be sure that it's worth the investment.
- **Browse:** low utility, low time-to-learn. You don't need this now, but it's easy to acquire so stay aware in case its utility increases.
- **Ignore:** low utility, high time-to-learn. You don't have the time for this.

Which Data Skills Should You Learn First?

Make the most of your limited learning time.



Source: Filtered



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Help your employees be more data-savvy.

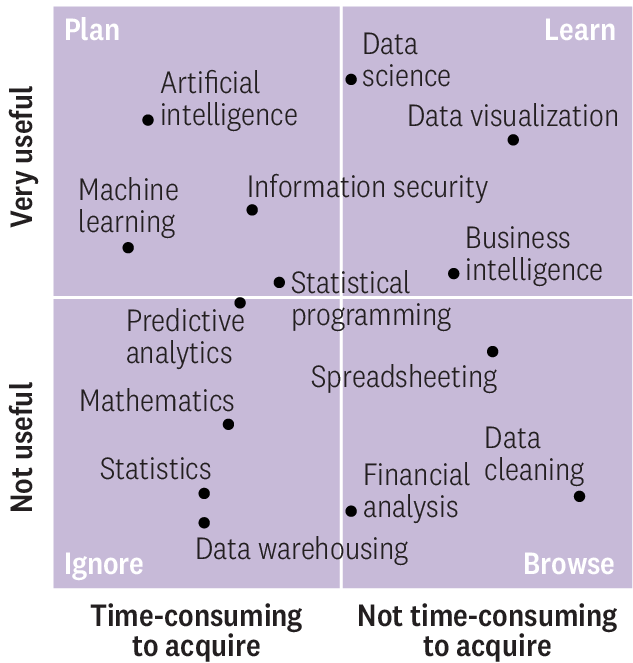
We did this for techniques, rather than for specific technologies: so, for machine learning rather than TensorFlow; for business intelligence rather than Microsoft Excel, etc. Once you've worked out which techniques are priorities in your context, you can then work out which specific software and associated skills best support them.

You can also apply this framework to your own context, where the impact of data skills might be different. Here are our results:

At Filtered, we found that constructing this matrix helped us to make hard decisions about where to focus: at first sight all the skills in our long-list seemed valuable. But realistically, we can only hope to move the needle on a few, at least in the short term. We concluded that the best return on investment in skills for our company was in data visualization, based on its high utility and low time to learn. We've already acted on our analysis and have just started to use Tableau to

An Example of How to Plot Data Skills on a 2x2 Learning Matrix

How one company mapped its own internal learning needs.



Source: Analysis of internal data learning needs by Filtered

improve the way we present usage analysis to clients.

Try the matrix in your own company to help your team determine which data skills are most important for them to start learning now.

Chris Littlewood is the chief innovation & product officer of filtered.com, an edtech company that uses AI to lift productivity by making learning recommendations. Find him on Twitter @filtered_chris.

This article is about DEVELOPING EMPLOYEES

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Comments

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4 of 11



10/25/18, 2:22 PM

38 COMMENTS

BEN HART 7 hours ago



I, as well, signed up to say that this article is very poorly written and researched. Particularly the much maligned quadrant. It should be pulled down lest you lead the less informed astray.

REPLY

0  0 **Corey Sykes** 21 hours ago



I signed up specifically to leave the comment that this should really be reviewed before publishing. That last matrix has me losing faith in HBR reporting.

REPLY

3  0 **Joe GoodLuck** a day ago



Hi, I just wonder what the author means by "..., at the expense of less quantitative roles". Here, does "roles" mean jobs or something else?

REPLY

1  0 **Alexander Klenner** a day ago



Despite the fact that the example matrix is ridiculous, Data Visualisation is actually not easy to learn. Misleading and bad visualisations of data are easy to do by just pumping uncleaned data, with statistically insignificant differences (but well, who cares about such subtleties as significance and p-values...) created by biased and badly evaluated models using wrong objectives functions into Tableau. That is correct. And fuzzy coloured blobs are still the best thing to impress clueless managers that are busy writing articles instead of using their time to learn the needed skills to actually lead their teams.

REPLY

3  0 **Simon S** 2 days ago

To make this article less outrageous, I suspect it would be very helpful to change the title. Making clear right from the beginning that this article explores a (possibly questionable) methodology by applying it to a specific company would probably attract less aggression, too. Somehow, the entire premise doesn't make sense without specifying a prior, or the current state of the company. But then again, maybe statistics is not worth thinking about? ;)

REPLY


1  0 

Hi, I've posted replies to a couple of comments below but wanted to make the point here since it clearly doesn't come through strongly enough in the chart alone (for which my apols). "Not useful" simply means focusing on that skill now is not important for your team now. That might well be because the capability is already well covered.

So for us at Filtered, maths and stats are already well covered, and further focus on building those skills is not useful relative to others.

I would never say maths, stats, etc are not useful generally.



REPLY | 4 replies

0  4 

John Snyder 2 days ago

Machine learning is just statistics with a bigger research budget.



REPLY

2  0 

Raul Landa a day ago

So you were improperly generalizing from a biased dataset (your specific viewpoint)? Clearly this matrix has served you well.



REPLY

1  0 

Vincent Buscarello 20 hours ago

Then what exactly is "Data Science", this skill you seem to need so desperately? Do you mean python? or spark? I'm sure you meant well and will improve in the future, but this is without a doubt the worst HBR publication I've seen.



REPLY

0  0 

Vincent Buscarello 20 hours ago

Conspiracy theory - this article is a brilliant trick to get more math nerds to register on HBR.



REPLY

3  0 

BEN HART 7 hours ago

It's the only reasonable explanation.

REPLY

0  0 

HBR Editors 2 days ago

Thanks for the comments on this piece. We've clarified the title on the last example matrix, to make clear that it is a representation of how one company might approach this exercise based on its context. The intent was that companies and people could tailor this matrix based on their own business needs. Thanks for taking time to share your feedback.

Vincent Buscarello 20 hours ago

It's still a bad approach. If "Data Science" doesn't include data cleaning, statistics, and mathematics, I'm not sure what it does include. Like I stated earlier - is this python? scala? spark? hadoop? employees will be left at a loss as to what they should learn with a chart like this.

This is typical MBA BS. Explain what you're actually an expert in - that is, the business aspects of the problem. Something like "faster results" or "more specific predictions" would be more useful than a weak attempt to put together an actual skill set matrix like this.

REPLY

0 0 0

Aditya Khadilkar 2 days ago

With due respect to your research on this 2*2 matrix and the Legacy of Harvard Business review, the use of words like "not useful" are not appropriate. This post is having a huge 'bias' towards Analytics. The chart shown highlighting diminishing CAGR on jobs in manufacturing has no 'correlation' here. If there are no jobs in Manufacturing, then what data will be fed to Machine Learning algorithms? Imaginary? I think you must learn to first to choose correct terminology... else Artificial Intelligence (programmed with "not useful" maths & statistics) will trash your articles rather than publishing.

REPLY

4 0 0

Ankylus Bodine 2 days ago

Whoever put that matrix together is an idiot who should not be allowed to leave the house in the morning unless accompanied by an adult. Seriously.

REPLY

3 0 0

George Purcell 2 days ago

I am registering just to post on how absolutely awful this chart is.

In any operational dataset BY FAR the most work and toughest job is Data Cleaning. I regularly spend 70-80 percent of my time on a multi-month project just turning an operational dataset into an analytical dataset. This is also where you begin to really understand the dataset. You want to develop a moat and expertise that can't be duplicated? Understand the ins and outs of a complex dataset!



Firing off R or SAS on a properly cleaned and understood dataset to conduct your analysis is trivial compared to developing your analytical dataset in the first place.

REPLY

5 0 0

Just registered accounts to say that these should really be reviewed before posting 8/10/which-data-skills-do-you...

REPLY



6  0 

Adam Jenkins 2 days ago

This article does not even come close to accurately describing what is useful to what data skills you need. "Data cleaning" can have huge impacts on the statistics of insights and business intelligence you get from the data, but based upon this matrix you would never know that because evidently you can ignore statistics in general.

I'd recommend HBR really start having technical writers review their work as recently the quality has decreased by magnitudes, lets say that they're on the low end of the bell curve....

REPLY

7  0 

Shawn Cooke 2 days ago



"In order to help you decide where to focus your development effort, we have plotted key data skills against this framework. "

Despite the mention "context" later on, this line indicates to me that the focus is very much on the reader. The use of the second person "you" and "your" makes the example matrix a recommendation to the reader, as opposed to a context-dependent example for the writer's organization alone.

I still think it's a pretty savvy article, however. I mean, look how many mathematicians and data scientists have linked to it all across the internet. I bet the page views are flowing in. Heck, I signed up just to be able to post this opinion.

Just goes to show you that the best way to generate discussion and to draw attention in the modern internet is to be so utterly, flagrantly wrong that everyone will happily jump in, just to rage-post.



REPLY

4  0 

p k 2 days ago

What a pile of rubbish... Echo the sentiments of the comments below. Who edits these? Goofy?



REPLY

5  0 

Nicholas Normandin 2 days ago

I registered just so I could say you should be deeply embarrassed by this post.

REPLY



6  0 

VinuCT 2 days ago

10/25/18, 2:22 PM

I seriously doubt the author's experience in analytics. He prepared the 2 x 2 learning matrix based on the



REPLY

6  0 **Hector Perio** 2 days ago

Most of HBR's writers studied for their MBAs, and many hold degrees that are far from pure STEM-like degrees such as computer science, math, and any kind of engineering, but some go through some math although that is true for just about every major. Math was probably written on the low priority list as "leaders" don't really do their own calculations and pass them to the engineers in their team.

It's not harmful to deviate from their usual topics of choice in management and leadership but ones like these are not approved by an adequate amount of STEM degree holders or employees to make them sound credible. HBR, please add more CS/math/engineering degree holders in your team of writers if you plan to write more articles like this.

REPLY

3  0 **Rudy Jackson** 2 days ago



While (for Harvard Business Review) publishing low quality articles is becoming more and more the norm, I have to admit that this article is (by far) one of the most clueless and self-contradicting I've ever read.

Statistical Programming without Math and Statistics ? That's like saying: lets skip learning language and write a poem.

This article is trending on Twitter (but mostly because real data scientists are making fun of Chris Littlewood's empty B/S-talk and cluelessness) , e.g.:

<https://twitter.com/economeager/status/1054530021870747648>

REPLY

6  0 **John Snyder** 3 days ago

Here's the gist of their 2x2 matrix:

Hard to learn but useful: BUZZWORDS!



Easy to learn and useful: OLD BUZZWORDS!

Hard to learn and not useful: Actual data analysis

Easy to learn and not useful: Boring but important



"We've already acted on our analysis and have just started to use Tableau to improve the way we present usage analysis to clients." Yeah, you're done.

REPLY

6  0 

Fake news Washington State University Computer Science Department for a thing you have so close by 10/18/10/which-data-skills-do-you...
https://www.washington.edu/computer-science/departments/faculty/robert-berkman/



REPLY

3  0 

hamid Kalhor 5 days ago

So cool and informative



REPLY

0  6 

SHEN MA 6 days ago

I certainly don't agree that the grid in the sense that "mathematics" and "statistics" are low priority. The machine learning that in the grid most like to mean how to apply different packaging in building models. Anyone who would like to build a solid machine learning model should understand the basic of them.



REPLY

5  0 

GREGORY BUCKO 6 days ago

How can data cleaning be considered "not useful" or even "not time consuming to acquire?" All analysis is built on a fundamental understanding of clean and structured data. If you shortcut that part, your visualization or whatever else you think is low-hanging fruit will be worthless. I won't even get started on where an understanding of statistics fits on your matrix...others have already beat me to it. I'd start over on this article.



REPLY

6  0 

Chris Littlewood 6 days ago

Hello Gregory. The plot shows our (Filtered's) estimate of the impact in our own context. We already have tidy data so cleaning isn't a high priority for us.



REPLY

0  6 

GREGORY BUCKO 3 days ago

Well then the title of your article should read: "What Data Skills Does Filtered Actually Need In Our Own Context? This 2X2 Matrix Should Tell Us"



REPLY

3  0 

Rudy Jackson 2 days ago



Chris, your article only proves that you have no idea what you're talking about (but you think you can compensate that by throwing buzz-words around) and you're company is probably just selling B/S to naive/uninformed clients.

REPLY

6  0 

Prioritize Which Skills are Worthless then and has absolutely nothing to do with the real world



REPLY

1  0 

Saikat Chakraborty 6 days ago

While the generalized matrix makes sense, the example below does not make sense to me. How can you ignore statistics & mathematics and jump to AI and ML directly? These are the foundations of the stuff that have been mentioned in the top quadrant. A large part of ML is used for predictive analytics!



REPLY

4  0 

John Warde 6 days ago

Mathematics not useful?!!



REPLY

5  0 

Chris Littlewood 6 days ago

Hi John! The grid is for impact in our context - where we have a high base level of capability in maths - so we didn't rate the impact of building that skill anything like as highly as some of the others in the list.



REPLY

0  6 

JEFF LEATH 7 days ago

Good luck learning ML and AI without learning statistics.



REPLY

12  0 

Ivan Pineda 7 days ago

Very helpful and clear to understand.

REPLY

0  3 

POSTING GUIDELINES

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