

## Data literacy and data and analytical strategy

We have been able to cover an immense amount of information with regards to data literacy throughout the first nine chapters of the book. One area we have not focused on heavily is data and analytical strategy. Yes, we have spoken on it in various ways throughout the book, and we are not going to dive in from an in depth perspective here, but I do want to touch upon many of the different areas of data and analytical strategy that I will call the ‘hyped’ areas. I do not mean ‘hyped’ in a negative way. I mean these are the terms and areas of data and analytics that receive much airtime in our lives, in our discussions on data and analytics, and in some cases are discussed with a zealot type mindset. I want to discuss just what these areas of data and analytics are and how they tie to data literacy. The areas we are going to cover are:

- data driven culture;
- business intelligence;
- artificial intelligence;
- machine learning and algorithms;
- big data;
- embedded analytics;
- the Cloud;
- edge analytics;
- geo analytics.

These, of course, do not make up the entire spread of a data and analytical strategy. There are many facets that can be a part of a strategy, and that is not to say everything *should* be a part, but we want to ensure you walk away with an understanding of these topics, how they pertain to a data and analytical strategy, and how data literacy skills can play a part within these subjects.

### Data driven culture

There are few topics that have received as much attention in recent years as organizations wanting to become a ‘data driven culture’. This topic warrants a lot of thought, ideas, and more. It also has become something of a mythology, as organizations do not know how to become an actual data driven culture.

In the year 2020, when the world saw things shut down in a heartbeat for the COVID-19 pandemic, organizations were looking to make the best decisions possible with many different facets of their business: employees and keeping them safe, helping customers to survive economic shutdowns, supply chain needs, digital transformation (as workforces were forced to become remote workers, instead of office workers), and more. These changes could be helped by a structured and powerful data and analytical framework, one where it had been working towards success for a long time. The problem? Most organizations found out quickly they were not really a data driven company, whether they felt they were or not. This caused a lot of anxiety and issues.

My calendar has been busy for a long time, but the moment COVID-19 shut the world down and organizations were looking for more, my calendar got even busier. I think that a lot of organizations played their data and analytical game much like an individual who is entering a swimming pool. We have all probably seen this or done this ourselves. We step up to the water in the swimming pool. We ‘test the waters’ if you will, feeling the water to determine its temperature. Instead of fully jumping in and immersing ourselves, we slowly inch into the water. As we inch into the water, those parts of the body

submerged in the water get used to the temperature, and so we move further and further in.

Then, there are those who do not even hesitate (one of my sons is this way) and see the pool, jumping right in without touching the water to feel the temperature. Those that quickly and without fear jump in and immerse themselves are already set and enjoying the benefits of the pool. Those who hesitate or slowly get in are not there, and if they wait too long they could run into issues, the pool could shut down, or they may not receive all the benefits of the pool. This landscape is like a company not fully immersing itself in the world of data and analytics.

The term data driven culture is not one that has a set definition. We do not need a technical definition for this word or term. It is in essence the way it sounds – this is an organization and a culture that is driven by its internal data and analytics. I am fond of saying we want to weave the DNA of data into the culture of an organization. We want to empower the organization with the DNA of data and analytics. That is a data driven culture, one where assumptions are challenged, data informed decision-making is harnessed, where data literacy thrives. Finding an organization that is succeeding with a true data drive culture is hard. There are staples like Netflix, Google, Amazon but outside of maybe a few, the amount of organizations who are truly data driven is a small, small number. There are far more companies that are wading in the water and slowly getting in, versus that have jumped into the water no matter the temperature.

Because of the 2020 worldwide pandemic shutdown, this term and phrase ‘data driven culture’ gained more steam. As organizations were only tiptoeing into the water and not immersed, as the shutdown opened people’s eyes to the realities they now faced from a data and analytics perspective, organizations realized they were not ready. The culture and workforces of organizations were not ready to pull the data informed decision levers to make decisions.

We have spoken at length about a data literacy culture in a previous chapter, so we do not need to address it here, but what does it have to do with data and analytical strategy? A data driven culture has most, if not everything, to do with a data and analytical strategy.

If we want the strategy to be effect and successful, we must have the right data driven culture, where data and analytics is woven throughout the organization and workforce. Data literacy is an enabling tool to make this happen.

I think sometimes organizations are looking at tools or the mythical and elusive data driven culture to be the strategy. Let me emphasize now: culture and tools are not strategies; they are enabling pieces. I use the analogy of building a house here. Imagine you want an amazing house to be built for you, so you buy some lumber, a hammer, nails, and maybe some other tools. You do not create the blueprint, but you expect it to work and be done. You then hire random people off the street and say, 'Build me my dream house.' How successful will you be? Unfortunately, you will not be. But now imagine you build the blueprints, hire an expert contractor, and get everyone on board to build your dream house. You have a house building culture already in your plans. This is our data driven culture.

Make the data driven culture unique to your organization – it is not a one size fits all approach. Some organizations are far along their journeys, some are not. Some organizations have a data literate workforce, some do not. Discover within your career and yourself, where you and your organization stand. Then, build the plans, blueprints, and strategy.

### Business intelligence

We cannot write a book on data literacy and not include the world of business intelligence. To start with, we can turn to the history of business intelligence and the tools that made this world. Unlike some of the terms you have read about in this book which are recent, business intelligence has been around for an exceptionally long time. Microsoft Excel started decades ago. In the early 1990s, we had the advent of business intelligence tools like Qlik. As the future of data grew, so did the suite of business intelligence tools, such as Tableau, ThoughtSpot, Microsoft Power BI, Alteryx, and more. The list is much longer than what I have shared. So, what is business intelligence?



From Investopedia, we learn that:

Business intelligence (BI) refers to the procedural and technical infrastructure that collects, stores, and analyzes the data produced by a company's activities. BI is a broad term that encompasses data mining, process analysis, performance benchmarking, and descriptive analytics. BI parses all the data generated by a business and presents easy-to-digest reports, performance measures, and trends that inform management decisions.<sup>1</sup>

Now, that is the technical definition, so let us put it into the non-technical sense. Business intelligence is the tools and sourcing of data that organizations can use to succeed with the four levels of analytics. Business intelligence allows us to gather data, simplify it, combine it, and utilize it in a tool such as a data visualization tool, utilized for analysis. Business intelligence helps us to utilize the empowerment of democratizing data to the masses. With that last part, we start to get a glimpse of how data literacy plays a part with business intelligence, but first let us talk about its place within the data and analytical strategy world.

Within a data and analytical strategy, there are multi-faceted approaches that need to take shape for an organization to succeed with data and analytics. One of those approaches is the tool suite the organization deploys for success. What kind of tool does the organization need to deploy for sourcing of data? What kinds of tools are needed to cleanse the data, for use on the democratized front? What kinds of tools are needed to analyze, visualize, and many other analytical aspects of the data? This is business intelligence.

Within the data and analytical strategy, teams are usually set up to help with the deployment and building of the business intelligence suite, sometimes referred to as the tool 'stack'. This suite is there to help the democratization of data throughout an organization, and to help the organization succeed with the four levels of analytics. This is where data literacy comes right into play, and if it is not present the business intelligence suite may not 1) work or 2) achieve its full potential.

As an organization builds its business intelligence tool suite, it will become very important for it to have a solid understanding of the four levels of analytics and how they will help it succeed with its data and analytical strategy. With each level of analytics, the tool that is there to enable the analytical level to succeed matters greatly. For descriptive analytics, we need the right type of dashboard and visualization tools. Having the right data visualization and dashboard tools is critical to ensure we are putting the right information in front of the right people. From there, the same tools can be good to help drive diagnostic analytics, plus there are those that can help us dig into our data more powerfully. The third level of analytics, predictive analytics, requires the right types of tools and software (and high data quality) to ensure the right predictions come out. The fourth level, prescriptive analytics, the right tools, and quality are a given considering this is where the data and technology can help us decide what to do with the data.

Overarching the four levels of analytics are business intelligence tools that will help the organization cleanse, source, and place the data in the right place at the right time. This is an especially important topic for another book, but in the world of data sourcing and management, technologies are advancing and evolving very quickly. As they advance and evolve, the right people in the right position matter, and the right data literacy matters to get the data. As we remember in the second step of our data informed decision-making framework, we need to acquire good data for our decision-making process.

In business intelligence, data literacy is designed to empower the organization to succeed with the democratization of data. Business intelligence is a tool to help within the democratization of data in the data driven culture blueprint (think of our building a house strategy). Within the blueprint of building our data driven culture, business intelligence tools can be seen as the data and technology software and tools given to employees to succeed with implementing the data and analytical strategy. Does that all make sense? Basically, business intelligence is the hammer and nails of the strategy and blueprint.

Data literacy then becomes the skills to utilize the tools correctly for the correct end result. In our data and analytical strategy, the end result is making a smart and intelligent data informed decision. We also need the right data fluency through our workforce so it can help shape the way data is utilized throughout. One thing to understand and note is data literacy is not just the theories and concepts that are utilized with data and analytics. Data literacy needs to also encompass learning how to utilize the business intelligence tools that are put at our disposal for data and analytical work. We can learn all the theory we want, but if we cannot implement it in a tool, in an effective manner, what good is our learning? The reverse can be true, too. What if we have learned all we can about a tool, but have no clue how to work throughout the four levels of analytics? Our learning can again be for naught. We need to marry these together to ensure we can be successful with both data and analytical work and business intelligence tools.

### Artificial intelligence

To help us understand the world of artificial intelligence, there is an order I want to follow throughout this part of the discussion. First, we will discuss just what is artificial intelligence. Then, we can discuss its implication in the world of data and analytics. Finally, we will look at the impact of data literacy on artificial intelligence.

From Merriam-Webster's dictionary we see that artificial intelligence is defined as: 'a branch of computer science dealing with the simulation of intelligent behavior in computers. The capability of a machine to imitate intelligent human behavior.' From this definition alone we can already start to see where artificial intelligence can come into the world of data and analytics, especially if it is imitating human behavior. This begs the question for me: can artificial intelligence make a smart, data informed decision similar to that of a human?

Below are some examples of artificial intelligence that will help illuminate what is meant by the term:<sup>2</sup>

- The use of Amazon's Alexa: In my household Alexa is a common tool to utilize (mainly for listening to music).
- Cogito: You may have interacted with the artificial intelligence deployed by the company Cogito and not even known it. From the company website we read: 'Cogito's AI solution delivers in-call behavioral guidance to agents and a real-time measure of customer perception for every phone conversation. Cogito is helping thousands of agents build better relationships with millions of customers.'<sup>3</sup> By using artificial intelligence, Cogito can help make our phone experiences more enjoyable and successful (hopefully).
- Nest: How many of us have seen this marvelous and powerful device? Nest is a digital thermostat for your home, learning and utilizing algorithms to drive heating and cooling. Oh, and by the way, did you know that Nest can be controlled by voice through Alexa? Funny how those things work themselves out.

Artificial intelligence is all around us in the world today, whether we know it, like it, or want to admit it. We have a responsibility to recognize its power and use it intelligently.

Within data and analytics, artificial intelligence has a powerful and empowering position. From the definition, we learned that artificial intelligence is trying to imitate intelligent behavior. What if we can get a computer or artificial intelligence to make smarter decisions for us in a data and analytical framework? That is power! Computers have so much more processing power than we do, at least from how many solutions and answers a computer can find versus us. Supercomputers can process so much more than a regular computer, giving them the ability to process and calculate many more things than we humans can do at any one time. Putting that power into the decision-making process is amazing and profoundly helpful. If we can have a computer working for us to make smarter decisions and powering a portion of our data and analytical work, we can see a greater return on our investments within these worlds, but what does it have to with data literacy?

The world of data literacy has an important and powerful impact on artificial intelligence, but I feel there is a misunderstanding about

what artificial intelligence is and what it can or will do in the world. A personal story will help illustrate my point on data literacy merging with artificial intelligence.

I was on a trip to South Africa to speak at a conference on the subject of data literacy. During the trip, I made visits to different organizations to talk about data literacy, deliver workshops, and so forth. On one of these visits to a company, I was presenting to a smaller group of employees and we were having a discussion and an open question-and-answer session. A gentleman in the audience asked an especially important question: ‘Won’t all this augmented or artificial intelligence make us lazy?’ Think on that question for a minute. What do you think? Will this make us lazy? My response to him hits home on my thoughts towards this wonderful and powerful topic. I want all of us to imagine for a second a dashboard or data visualization we own. This particular piece of work is one we have to prepare on a weekly basis and it usually takes about three hours to prepare the dashboard. Once complete, you send it on to the appropriate parties. Now, imagine that artificial intelligence is implemented in the organization, for that particular dashboard. What once took three hours now only takes 15 minutes. Do you just become lazy? No! You now have an additional 2 hours and 45 minutes to complete a deeper dive into the information or work on other projects.

To me, the advent of artificial intelligence does not make us lazy; it can help enhance our productivity. By empowering us with more time in our roles, we now have more opportunities to implement the three Cs of data literacy: curiosity, creativity, and critical thinking. Unfortunately, much of our work is not of the ‘deep work’ variety, as Cal Newport would say.<sup>4</sup> A lot of our work is probably found within the same, mundane tasks, email opening, and surface level work. By implementing artificial intelligence in the work, we now have the ability to utilize our data literacy skills to succeed with data.

Along with artificial intelligence opening up doors of opportunity and availability, it will help individuals and organizations work through the business intelligence suite and/or the four levels of analytics. Artificial intelligence can be found with descriptive analytics, building dashboards and visualizations. In diagnostic analytics, having

an intelligent computer can help individuals look and find new and improve insight. Within predictive and prescriptive analytics, artificial intelligence can play a crucial role as the power of computing and processing speed can bring about great predictions and help us understand what we should do.

Overall, artificial intelligence, while a bit overhyped at times, is a powerful addition to any data and analytical strategy.

### Machine learning and algorithms

A close follow-up to artificial intelligence is that of machine learning and algorithms. Let us start with algorithms, as that is something we are all probably more familiar with. An algorithm is ‘a step-by-step procedure for solving a problem or accomplishing some end’.<sup>5</sup> Basically, an algorithm will do a calculation or set of steps of calculations for a direct purpose or designated end.

There are many examples of algorithms in the world. One example of an algorithm is found within banks and financial services. Banks and financial services industries lend and loan out a lot of money. While they loan out this money, determining who is creditworthy and will pay back the loan is of the utmost importance. As humans, we have the ability to figure out how we can assess the worthiness of a potential customer, and then make a decision. On the other hand, why do we not utilize the power of an algorithm to sift through all of the data to find a concrete decision on if we can loan to certain people? Now, this type of work and algorithm can be good, but, like some others, it can be fraught with flaw and bias. Who writes the algorithm? Who sources the data for an algorithm?

I know I am over-generalizing here, but there can be issues of bias and flaw within algorithms. As humans have flaws or bias built in themselves, when they work on, build, source data for, and implement algorithms, those biases and flaws can creep into the results. These types of flaws have been found and seen within the world of algorithms and artificial intelligence.

A cousin to algorithms is machine learning. What does machine learning sound like? Well, it sounds like the machine, a computer, will learn. That is exactly correct! According to the MIT Technology Review, ‘machine learning algorithms (see, a close cousin) use statistics to find patterns in massive amounts of data’.<sup>6</sup> Investopedia says ‘Machine learning is the concept that a computer program can learn and adapt to new data without human intervention. Machine learning is a field of artificial intelligence (AI) that keeps a computer’s built-in algorithms current regardless of changes in the worldwide economy.’<sup>7</sup> Essentially, machine learning is the field where algorithms are learning by themselves, and can improve for the betterment of our organization, data, analytics, etc.

Within our data and analytical strategy, and within data literacy, algorithms and machine learning have a place, but we must understand it is a very ‘technical’ space. It is powerful to have machines working on your side, learning on their own, and so forth, but without an empowered workforce that is able to use the results, it can be meaningless. In this case, data literacy is the power that allows the workforce and culture to succeed with machine learning and algorithms.

If we are working through our data driven culture and data and analytical strategy, algorithms and machine learning should be empowering the workforce, the human element of data, to have more time for interpretation, asking questions, and so forth. It should also empower the human element to make smarter, quicker decisions. This is where data literacy comes into play. As an algorithm or machine learning system works through the data, gives you results, and continues to learn by itself, you the practitioner had better be ready to utilize the data that is provided to you and make smarter decisions. Here we can see the power of the third characteristic in the definition of data literacy: analyze data.

If we want to ensure a workforce can properly utilize the data that an algorithm or machine learning shares with us, we need to ensure our data literacy strategy and learning are sound and efficacious. Herein we also see the necessity of being able to speak the language of data, data fluency, and of using the three Cs of data literacy. As we are utilizing the algorithm designed for us, our curiosity should pique



and we should ask questions of the results, we should be creative with what the results show us, and of course we should critically think on the information. When the algorithm gives us information, we should utilize our power to critically think on the information and determine if there are flaws or biases in the results we are using.

### Big data

The term ‘big data’ really came into vogue during the 2010s. The concept of big amounts of data is almost too good to pass up, right? What if we had large amounts of data that allow us to sift through, find insight, and really can help an organization to succeed with its data and analytical strategy? Seems like a great story and something every organization should utilize and capitalize on.

Big data is ‘data that contains greater variety arriving in increasing volumes and with ever-higher velocity. This is known as the three Vs’.<sup>8</sup> The three Vs are volume, velocity, and variety. These magical words should make sense of how an organization can capitalize on the vast amounts of data that it is producing. In my career, I worked for one of the world’s largest financial institutions. The amount of data being produced within that organization certainly hit the indicators of big data. The volume of data was vast. The velocity at which data was entering the organization was quick. The variety of data came from all over the world. Certainly, the case could be made that the data was ‘big data’. But does big data live up to the hype?

Over time, the reality came to be that it was not only ‘big data’ that mattered, but small data, mid-size data, and more matter as well. It is not just big data that organizations need to capitalize on, but data of all shapes and size. If they are only focusing on big data, the organization can be missing out on the power that *all* data can possess.

Within the bounds of data and analytical strategy, individuals and organizations need to realize that they can get caught up in the hype of the data and information shown to them. In this case, I am speaking about the hype and hysteria that was shared around the world about big data. Within your data and analytical strategy, yes, you



may need to source and have a system that can handle the expanse of big data your organization may capitalize on. Keep in mind, though, that your organization and you yourself may need to also source and capitalize on the data that comes in other sizes.

With data literacy, the result is the same: learn how to work with data and analytics and get comfortable with it. It does not matter if you are looking at big data, small data, round data, triangle data, and any other name I can come up with followed by the word 'data'. As individuals, we need to get comfortable with and be able to utilize our data literacy skills, the four levels of analytics, and the three Cs of data literacy effectively to find insight in the data.

### Embedded analytics

The world of embedded analytics is a new and burgeoning field within data and analytics; I will add that it is also an especially important field that has emerged in the world of data and analytics. Embedded analytics is 'the integration of analytic content and capabilities within applications, such as business process applications (e.g. CRM, ERP, EHR/EMR) or portals (e.g. intranets or extranets)'.<sup>9</sup> Essentially, embedded analytics is where the analytics are put right at the fingertips of a workforce. Doesn't that just make sense? This has not always been a part of the systems we use on a regular basis, at least not in the manner and way needed. Embedded analytics is becoming a crucial part of a successful data and analytical strategy.

Within the framework of a data and analytical strategy, there are multiple areas that embedded analytics touches upon. First, we know that the world of data democratization is crucial for data and analytical success. We need to put data and information into the hands of the masses in order to capitalize on the amazing talents of the human element and workforce. This has usually been done with the business intelligence tools we have already discussed in this chapter, but what if we can improve it even more by embedding the analytics in the systems we use on a regular basis? What might this look like?

First, let us imagine you are a sales rep with a strong book of clients, and you are looking to expand the organization's client base, and establish new clients and stronger footholds with the clients you already have. Your organization is launching a new product line that you want to advertise to your clients, but you are not sure you know which client to advertise to. What if built right into your sales software was an analytic capability to filter, dissect, and understand your client base better? This would enable you, the sales rep, to make a smarter, quicker decision around who to target for the new product line. If this embedded capability did not exist, then you may have to go ask someone to filter the data or pull reports for you, slowing down the process, and, as people know, timing can be everything.

A second example can derive around a warehouse and stocking of product lines. Personally, during my younger years, I worked in a warehouse where the movement of product was of the utmost importance. Not just in supplying the shelves with enough product, but in the processing of orders from customers in a timely manner. The software we used would update on a quick basis, if input accurately (see, even if you are in a warehouse and feel data doesn't matter to you, it does), and we could see how many would be in stock. What if we had embedded analytics right in our shipping software and could see what customers might order based on history or we could see different analytics on our shipping process, empowering us to make smarter, quicker decisions with our shipping orders? Again, the power of embedded analytics is at the forefront, bringing data to the fingertips of a worker. The reality is, a lot of times the warehouse staff might not be seen as needing data literacy or the ability to have analytics, but this could not be further from the truth. When they are empowered, the whole team can be empowered.

A third example can come from my personal life. I love my ultra-marathon running, as you have probably been able to tell through the reading of this book. As I go about my training, I need to pay attention to the data and information my body shares with me. What if there was another powerful way to understand my training and how I was performing in my progress and plan, my ultra-marathon strategy if you will? It just so happens, there is: embedded analytics.

For my running, I utilize a smart watch that allows me to track my running in the mountains. It is so powerful in that it doesn't just measure and monitor my mileage and elevation, but it will also track my vertical feet ascended and descended, pace, cadence, heart rate (max and average), estimated VO2 Max, calories burned, and more. I can pull up my watch's phone and look at what I was able to do, studying the metrics. I can then utilize these embedded analytics to enhance my overall ultra-marathon plan.

I think, through these examples, we have been able to see why embedded analytics are a powerful way to enhance a data and analytical strategy. Through the examples, we have been able to see how data literacy matters greatly, no matter your role or position in a company. With data literacy, you will be able to read the embedded analytics, work with them to filter and enhance, analyze to ask questions and get answers, and finally, you can then communicate out decisions to others. With your powerful data literacy skills, you will be able to use curiosity to ask questions of the embedded analytics, use creativity to create a powerful story, and critically think on the information.

### The Cloud

Here is another term that you may hear on a regular basis, especially as it deals with data. The Cloud is not some mysterious thing that exists in neverland. The Cloud is essentially a place to store and maintain your data offsite. Historically, organizations have held their data in data warehouses or other features, on premise. The problem with this philosophy and strategy is storing your own data can be expensive, as you have to constantly house your data and buy bigger and bigger servers. The Cloud allows organizations to store data in other areas, off premises.

Should moving data to the Cloud be a part of a data and analytical strategy? Absolutely! Some of the benefits of the Cloud include: flexibility, reliability, a good investment, mobile access, recovery, environmental advantage, security, access, and monitoring.<sup>10</sup> All of these sound like

important reasons the cloud should be a part of a data and analytical strategy.

Data literacy plays a part with the cloud when it comes through data fluency. The actual movement to the cloud or knowing from where you access the data is not as important or as big a part of data literacy. You will still use your powerful data literacy skills with analyzing the data, regardless of where the data resides.

### Edge analytics

Edge analytics is a new and powerful field within data and analytics. 'In brief, edge analytics involves collecting and analyzing data at the sensor, device, or touch point itself rather than waiting for the data to be sent back to a Cloud or on-premise server.'<sup>11</sup> We have spoken about the sensors and data collection of the Internet of Things. Edge analytics is taking the collection and analyzing of data to the sensors and other devices, versus waiting for that data to be collected and ready for analysis. I think that embedded analytics is a cousin to edge analytics. Here we see real-time and powerful analytics, game changing if you will. Imagine the collection and analytics that flights can get from the airplane engines or the safety and health power from self-driving cars. Edge analytics is a powerful way to analyze data, but what kind of place does it have within the world of data and analytical strategy?

Within data and analytical strategy, yes, edge analytics has a place. Will the majority of a workforce be working with edge analytics? Probably not, but it may be a part of their roles or they may deal with the data as it is produced, collected, and analyzed. Edge analytics most definitely needs to have its place within the umbrella of data and analytical strategy.

Again, as with the Cloud, it does not matter where the data is collected, processed, and analyzed, you must use your arsenal of data literacy skills with confidence, empowering edge analytics throughout an organization. Edge analytics has such great power, but like a lot of things within the data and analytical world, it can fizzle away for

companies and organizations if the adoption of edge analytics does not come to fruition. In this case, use your data literacy skills to help your organization succeed with edge analytics. Do not let another investment in data and analytical work at your company not gain the return on investment it deserves because the workforce is not data literate enough to see it come to fruition.

### Geo analytics

Our final topic in this chapter is geo analytics. Although this is our last topic, we have not created an exhaustive list of data and analytical strategy topics; there are many others.

Geo analytics is geography analytics. There have been great advancements in the use of geo spatial data and then mapping data into regions, etc. Here are just a few examples of how geo spatial data can be used to understand information:

- Understanding the movement of a virus and its impact. The world saw this brought to the forefront during the COVID-19 pandemic. As the coronavirus moved through the world, geo data and analytics were used to allow areas of the world to open and shut down at different times and places.
- Sales information. If you are mapping out your region, you can see where customers are buying and not buying. What a powerful way to understand trends and information towards your customer base.
- Crime waves. Using geo mapping with data and analytics, organizations can map out and understand where crime is happening, the kind of crime, trends, patterns, and maybe even use it to find criminals.
- Data visualizations. One way I have seen geo analytics work is through mapping analytics on a map, such as a person or body, car, etc. This allows us to map on different areas of a body or car where the data is occurring, allowing us to map, understand, and analyze the data and information.

- Supply chain analysis. Supply chain is a powerful logistics strategy, but can also have issues. Through geo analytics, organizations can understand what is happening in their very own supply chain and potentially where roadblocks are happening, quite possibly literally.

Geo analytics is a powerful addition to organizations' data and analytical strategy, and a unique section of data literacy. Organizations should utilize geo analytics where appropriate within the strategy, but not force it. Use it appropriately and where it can help, but just because something can be mapped does not mean it should be. This is something all organizations could learn: just because you can do something within data and analytics, does not mean it should be used. Figuring this out is a great skill within data literacy.

The same can be said about data literacy within geo analytics. Understanding and reading a geo map with data and information is not necessarily a hard skill to learn, but first master standard data and analytical learning. Over time, you will be able to adapt, apply, and empower yourself with geo analytical learning.

### Chapter summary

As has been said, this is not an exhaustive list of data and analytical strategy topics, but it is a good list. One key thing this chapter should do for everyone is enhance their data fluency, a crucial part of data literacy. Within this chapter, we discussed such topics as machine learning, edge analytics, and geo analytics. Before this chapter, if someone had spoken to you on these topics, how well would you have been able to hold a conversation? I would love to hear confidence in your voice when you say, 'I could have held this conversation!' Unfortunately, most cannot. Now, using this chapter, expand your data fluency.

Not only did you learn about data fluency, you now have expanded your data and analytical strategy knowledge, plus data literacy and how it can be applied to these topics. Utilize this chapter as a framework on how to study other great topics in data and analytics.

## Notes

- 1 Frankenfield, J (2019) Business Intelligence – BI. Investopedia. 23 June. Available from: <https://www.investopedia.com/terms/b/business-intelligence-bi.asp> (archived at <https://perma.cc/MKG5-HPQ8>)
- 2 Adams, RL (2017) 10 Powerful Examples of Artificial Intelligence In Use Today. Forbes. 10 January. Available from: <https://www.forbes.com/sites/robertadams/2017/01/10/10-powerful-examples-of-artificial-intelligence-in-use-today> (archived at <https://perma.cc/J289-QZB4>)
- 3 Cogito (undated) About Cogito Corp. Cogito. Available from: <https://www.cogitocorp.com/company/> (archived at <https://perma.cc/6BYK-CJYY>)
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