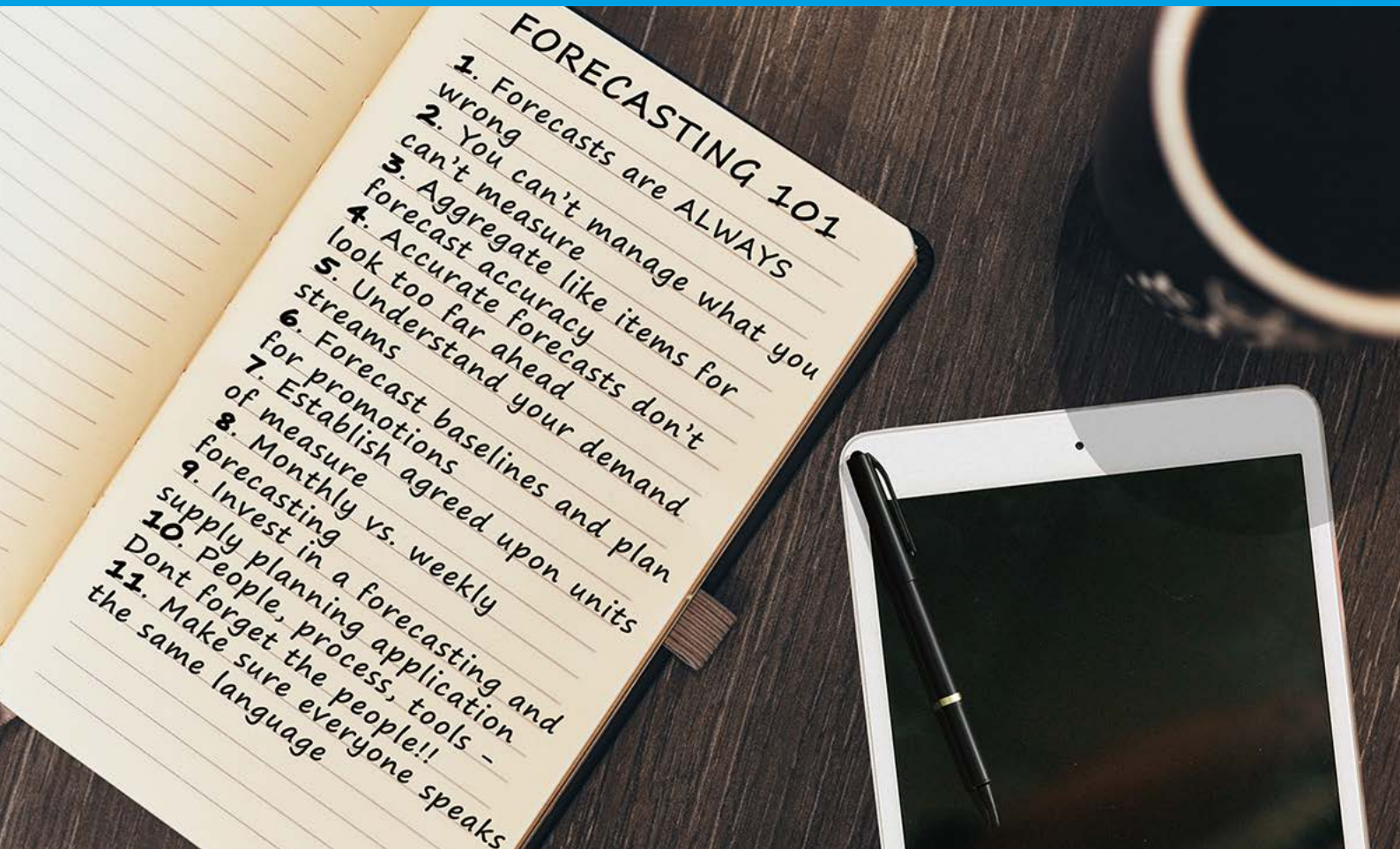


Forecasting 101

11 Forecasting Fundamentals Every Supply Chain Pro Needs to Know



Forecasting technology is always growing more sophisticated, or at least more complicated. At the same time, your customers' expectations for service level and fulfillment are more demanding than ever.

Newer technologies - like complex algorithms, machine learning, and AI - are often touted as delivering better forecasts. However, without a good understanding of forecasting fundamentals, you won't be able to apply those tools correctly.

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Why master the fundamentals first? According to Shaun Snapp, an industry expert and technology evaluator at Brightwork, most companies don't have the expertise to fully implement the current technology. For this reason, newer applications and more advanced technology will be of little use to them.

Or, as he puts it: "The continued shortcomings in mastering a far less complex forecasting category portends poor outcomes from machine learning in supply chain forecasting."

In most cases "machine learning" means adaptive algorithms which are set up and controlled by humans. This is already how most forecasting and supply chain planning software works. Slim4 from Slimstock has over 25 years of refinements to the forecasting tools and algorithms that make up its backend, and a proven track record of lowering inventory and increasing revenue.

So, whether you're still manually updating inventory or are a seasoned supply chain pro, here are 11 forecasting fundamentals you need to know:

1. Forecasts are ALWAYS Wrong!

It might sting a little to see those words, but it's true. No forecast is 100% accurate. Instead of eliminating forecast error, your goal should be to manage it and plan around it. This is done by identifying important items – typically through a combination of methods such as [ABC / XYZ Analysis](#) or Demand Classification - and setting service level targets for them.

You can't guarantee an item will be available 100% of the time, but with the proper planning you should be able to guarantee your customers availability at 95% and up for your most popular items.

It can be tempting to "set it and forget it" with order quantities once your goals have been reached. However, good forecasts are dynamic and change with your business environment. Make a habit of reevaluating your targets at least once per quarter to verify that they're where they should be and refine the ways you deliver on them.

2. You Can't Manage What You Can't Measure

If you sold about as many items as you thought you would, you might say that the forecast was accurate. But, when carrying too much inventory can cost thousands or hundreds of thousands of dollars, forecast accuracy needs to be more detailed for you to know if you're operating efficiently.

A reliable method for measuring forecast accuracy is to subtract your forecasted sales from your actual sales and then divide that number by your actuals. Then multiply that number by 100, and you'll end up with the percentage of error in your forecast.

For instance, in a given month you forecast 50 sales, but actual sales are 46. Using the below formula come up with -8.7% forecast error. Another way to say it is that you had 91.3% forecast accuracy.

$$\text{Forecast Error} = \frac{(\text{Actuals} - \text{Forecast})}{\text{Actuals}} * 100 \text{ or } \frac{(46 - 50)}{46} * 100 = -8.7\%$$

Knowing your accuracy for a single item for a few months is only of limited usefulness. Forecast accuracy becomes most useful when you've calculated it over months or years for most of your SKUs. It is then that you can look for patterns and make adjustments based on factors like seasonality and differences in regional demand.

Calculating accuracy for each of your SKUs is often too laborious, so it's best to measure at a group or family level where possible unless it is a critical item. That said, having that information for each SKU is highly valuable, which is why it's smart to find a forecasting and supply planning application like Slim4 to do the work for you.

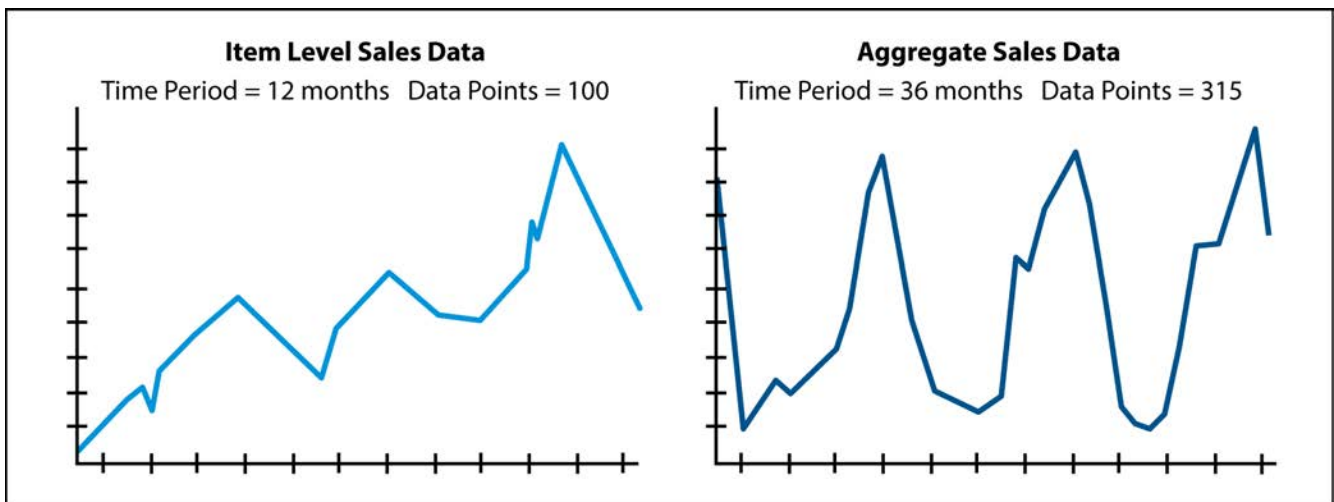
3. Aggregate Like Items for Forecast Accuracy

If your inventory consists of many different kinds of like items, then aggregation is your friend. For instance, it can help you if you distribute pop - or "soda", depending on where you live - that comes in different packages (e.g. 6 packs, 12 packs, cases, etc.), or you if you sell shoes that come in many different sizes.

Aggregation is beneficial because of the law of large numbers. This law states that the larger a sample size you have, the more representative it is of the total population. Practically, this means forecasting all of your different package sizes together as simply "cans of cola" rather than forecasting them individually as 6 packs, 12 packs, etc.

This translates into more accurate forecasts because it gives you more data to work with. More data is helpful because it:

- A. Provides more points to analyze for patterns, trends and seasonality.
- B. Smooths out random variation that can disrupt models at an item level.



Using aggregation in your forecasts does require you to disaggregate your order quantity back down to an item level once it has been calculated. This means figuring out the number of 6-packs and 12-packs you'll need after you've determined the total number of cans of cola to order using the aggregated data..

While it might seem like you're just adding extra steps to your forecast by aggregating your data only to disaggregate it, the improved statistical validity that comes from this method more than justifies the effort it requires. Not all items lend themselves to aggregation, but you should take advantage of it where you can.

Of the techniques discussed in this paper, aggregation is on the more advanced side. There are many resources online that can help you, and of course we'd love to talk about it more with you!

4. Accurate Forecasts Don't Look Too Far Ahead

What's the farthest into the future that you think you could forecast an SKU that sells consistently? Weeks? Months? Years? While it can be tempting to just cut and paste your numbers for items with steady turnover, experience has shown us time and again that banking on this kind of predictability leads to forecasting errors and lost dollars.

This is because every supply chain has a lot of variability. Think of the steps necessary for procuring raw materials, manufacturing, shipping, or the logistics of moving goods internationally. Once these are considered, it becomes clear why closer is almost always better for forecast horizons.

A forecast horizon is the timeframe that future forecasts are prepared for. A maximum forecast horizon may not be as long as you'd like, but it has to take into account variability on the production and consumer sides.

For minimum forecast horizons, use the lead time or cumulative lead times of raw materials, manufacturing and transit. By working to reduce minimum lead times you can lower holding costs and reduce the necessary forecast horizon.

5. Understand Your Demand Streams

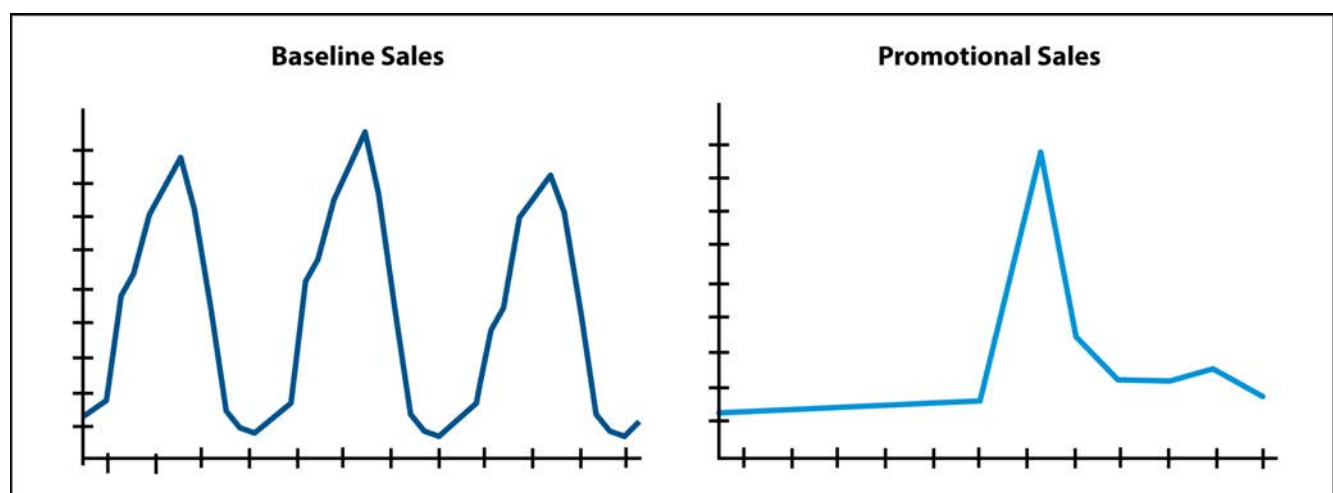
If you're a cabinet hardware manufacturer that sells to big box stores and local hardware shops, would you expect their demand to be identical? No. It's for this reason that forecasting for established demand streams makes sense for most manufacturers, wholesalers and distributors.

While dividing your forecast up into smaller sections might seem like it goes against the advice of point #3 of this list, Aggregate Where it Makes Sense. However, think of demand streams as a further refinement of your forecast rather than a failure to aggregate.

On a practical level, some customers are simply big enough that they get special treatment. There are no hard rules for determining this, but it's a safe bet that you already know if this is the case for your business. And big picture, gaining a better understanding of the needs and behaviors of each stream helps reduce stockouts and excesses.

6. Forecast Baselines and Plan for Promotions

If the previous quarter's demand for a top selling item looks almost like a straight line, chances are you know what your baseline sales are. But what about if the next generation of that item is about to come out? Running a promotion on the soon to be outdated inventory will help you avoid it becoming obsolete on your warehouse shelves, but how do you forecast for it?



The best answer is, don't! Unless your promotions are always at the same time of year and/or the same circumstances, it's best to segregate promotional sales from regular sales. Of course it's necessary to plan for promotions, but including sales from irregular or one-off events in historical sales can skew data and increase forecast errors.

7. Establish Agreed Upon Units of Measure

In an ideal world, all of your suppliers' MOQs would match your needs and everything you sold would be in units of 10. But of course that's not the world we live in. Adding to the external challenges you face in

keeping your business aligned is the fact that different departments within your company will often use their own units of measure.

Marketing, sales, operations, and finance all have their opinion about what unit of measure should be used to forecast. Agreeing on a unit measure that every department can use takes work, but having alignment within your company will save you time. Your top priority should be finding something that works for operations. This is because if sales are coming in, other departments are usually willing to work with you.

That said, whatever measurement you decide on will need convert from units to dollars, and working with a measurement that can easily convert into multiple sales units will make growth easier down the line. To make your data accessible, always store it at the lowest level possible to allow for translation.

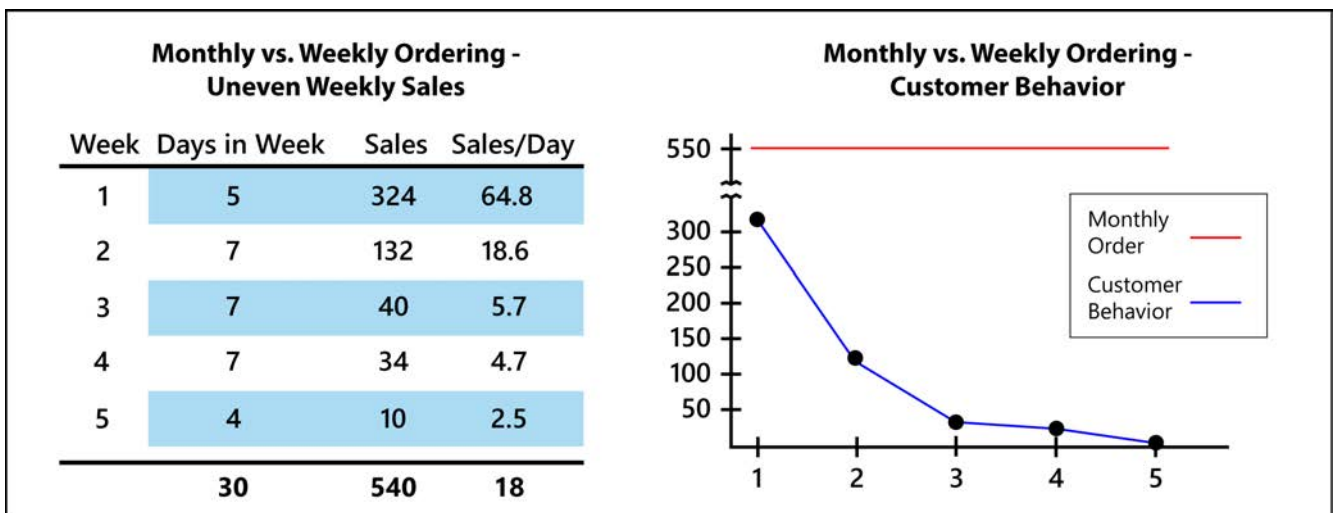
8. Monthly vs. Weekly Forecasting - What Works Best?

When preparing to order inventory, two approaches are typically used – **monthly forecasting and weekly forecasting**. **But which method works best?** The temptation to default to weekly forecasting can be understandable because on the surface it can seem timelier and thus more accurate. If 12 data points are good, then 52 should be better, right? This isn't always the case.

Monthly forecasts work best for most products because they tend to generate lower forecast errors. While there is variation in how many units are sold week to week within a monthly forecast, thanks once again to the law of large numbers, you're more likely to have the right products on your shelves whether it's 1st, the 15th or the 30th.

The three primary reasons monthly forecasting is more reliable are -

- Monthly forecasting's larger order period better absorbs changes in customer order timing.
- Monthly orders reduce the number of zero entries in your data, so the law of averages works for you.
- Monthly timeframes handle seasonality better. Months are predictable – they're in the same order every year. Weeks can move around +/- 4 days in either direction.



The above charts show how a monthly forecast can be better at accounting for different weekly sales totals.

Weekly orders are most helpful for companies working with large retailers – e.g. Wal-Mart, Target and other Big Box Stores - that provide weekly order amounts to them, or have items with an observable repetitive pattern of usage within each month.

9. Ditch Excel and Invest In a Forecasting Application

Ordering with Excel requires a disproportionate amount of time gathering and inputting data. This means less time is spent evaluating it. Investing in a forecasting and supply planning application like Slim4 frees up valuable time, and should pay for itself with efficiency gains.

Here are 5 ways to tell you're done with Excel -

- A. Formula Errors Are Costing You Money** - When you use Excel, formula errors are only a single keystroke away. This risk increases as the number of cells in your spreadsheet grows.
- B. You Don't Know Who Changed the Spreadsheet** - Excel isn't designed as a collaborative piece of software, so trying to use it as one will always lead to difficulties.
- C. You Spend Hours on Reporting** - Producing useful reports from a spreadsheet requires too much time. Forecasting and supply planning software creates reports automatically that are more accurate and useful than Excel.
- D. Spreadsheets Create A Single Point of Failure** - Having one person in your office manage spreadsheets creates a single point of failure. Software like Slim4 removes this risk by having multiple users and different levels of access.
- E. Falling Behind On Best Practices Costs You Money** - If you're ordering from Excel, it's unlikely you're making gains in efficiency. Slim4 is able to save companies money because it identifies inefficiencies by constantly updating with best practices and new features.

10. People, Process, Tools - Don't Forget the Process!

While forecasting and supply planning tools are great, they don't guarantee success on their own. No matter how good the tool, the data, and the people running it are, if there isn't an effective forecasting process in place then the results will be suboptimal.

The formalization of processes isn't something that comes naturally to many companies, but is instead borne out of necessity. There's an upper limit on doing things a certain way because that's just always the way you've done them. Signs you've reached that point vary by company, but usually include stagnant revenues despite good product turnover, burnout in your supply chain team, and falling customer satisfaction levels.

What does it mean to have more formalized processes? It means setting up a framework to guide people through analyzing forecast accuracy, reviewing automated forecasts for exceptions, providing insights where possible, logging assumptions used to adjust a forecast for review, etc. Formalizing these processes makes them measurable, the importance of which was discussed in point #2.

11. Make Sure Everyone Speaks the Same Language

Do not assume that everyone on the team understands who, what, when, where, and why of forecasting. If your company is big enough to need a warehouse, then accurate and effective forecasting is something that requires a total team effort. For this reason, it's critical that everyone involved - from finance, to marketing, to sales, to operations - is on the same page and has a common level of understanding.

From the supply chain side, bringing the rest of your team up to speed on supply chain fundamentals will make your work easier. Helping more people understand what you're doing should make for more informed decisions. Even with buy-in from management, it will still likely be on you to provide the education and training necessary to get people to the lowest common denominator of knowledge. This will be time well spent!

Slimstock has been helping companies like yours lower inventory costs while increasing customer satisfaction for 25 years. Our inventory management software is used by over 1,000 customers worldwide to free up capital and simplify the ordering process. Chat with one of our friendly customer service reps today to learn how we can help optimize your inventory.



Since 1993, Slimstock has been synonymous with inventory optimization, improved demand forecasting, clear inventory analysis, increased service levels and fewer stockouts. We've earned the trust of over 1,000 customers worldwide as a true inventory management partner, across a diverse range of industries, covering large, medium and small enterprises.



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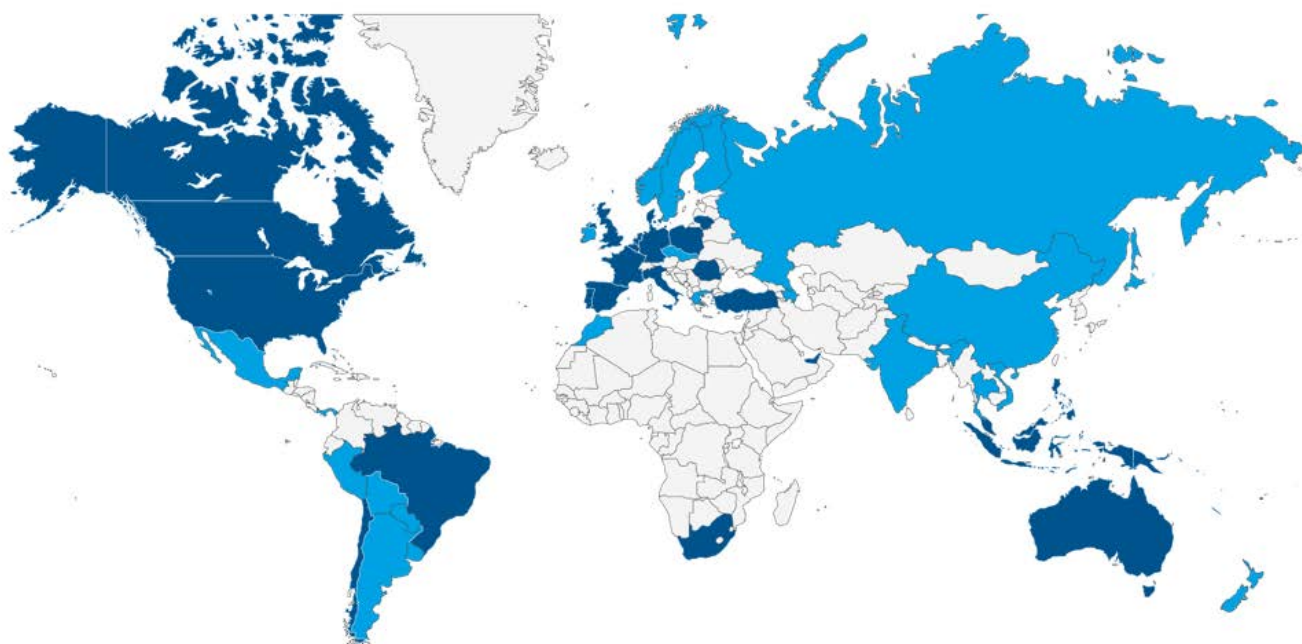
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