



A Guide to:
Capacity Planning

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Introduction

Hi, my name is **Martin Griffiths** and I help **manufacturing professionals** who are want to implement modern digital manufacturing systems to improve productivity in their business.

This guide to **CAPACITY PLANNING** will help you identify the different capacity planning techniques, and which one is best suited to your business.

The end result: You'll have a clear plan of how to implement Capacity Planning whilst making the biggest impact on productivity.



And have more time to focus on strategy and growth.

In a way that takes your confidence, your teams confidence and your customers confidence to a **whole new level!**

Dive in and discover how top-tier capacity planning can redefine your manufacturing excellence!

This is what you'll get:

- ✓ Discover the 4 main techniques of Capacity Planning:
- ✓ Rough capacity estimating with **Overall Factors**
- ✓ Plan capacity across work centres with **Capacity Bills**
- ✓ Perform time phased scheduled planning with **Resource Profiles**
- ✓ Learn how **Capacity Requirements Planning** can give detailed, accurate day and shift plans
- ✓ And in addition, 2 techniques for scheduling a production plan:
- ✓ Finite Capacity Scheduling
- ✓ Advanced Production Scheduling

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What Is Capacity Planning?

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Have you ever gotten to a point in your business where demand is just overwhelming your manufacturing capacity? Parts are on backorder, one of your key staff members is on family leave, and you seem to be snowballing into manufacturing overload.

Let me ask you this - what would happen if a manufacturing machine gave in at the same time?

These are all aspects to think about when running a successful business, which is why planning and controlling your manufacturing capacity is so important!.

Capacity Planning is determining the ability of your manufacturing operations to meet a forecast order demand plan.



You want to meet the amount of clients' orders, at the right time, with the right quality, right?

Of course you do!

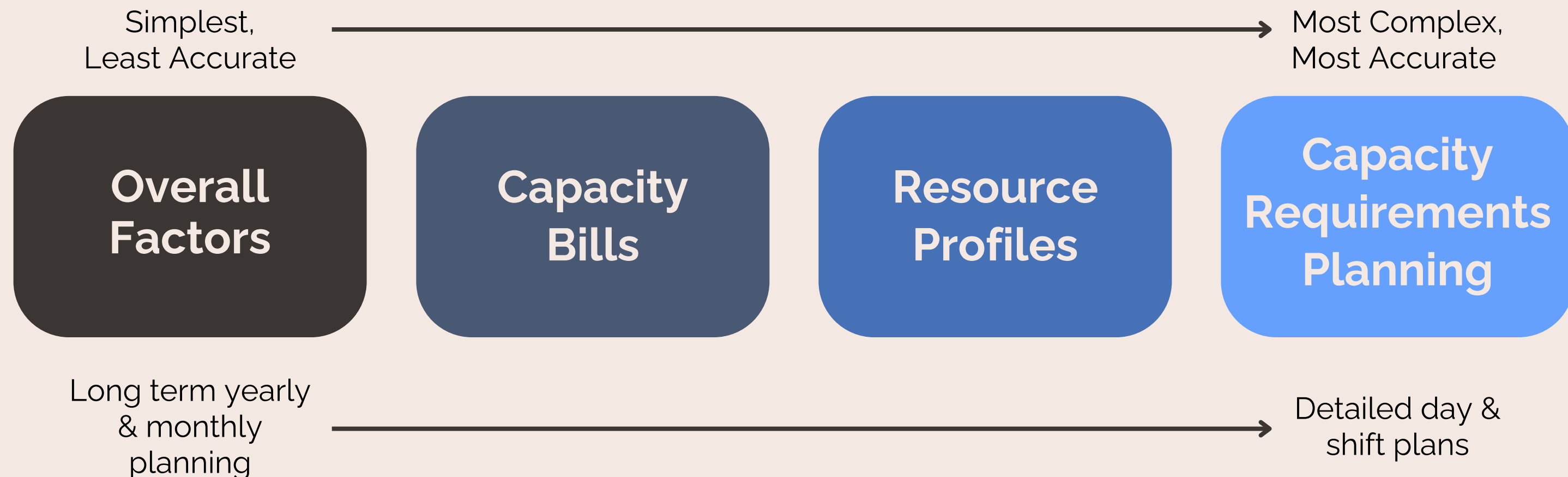
At the end of the day, you want to be ready for anything to happen and still provide your clients with the services they expect.



Capacity Planning Techniques

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There are four main Capacity Planning techniques that will help you to be prepared to meet order demand, we'll cover each one in more detail in this guide.





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Overall Factors

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How It Works

Overall Factors is the simplest, quickest and roughest of the capacity planning methods. It uses accounting data only, taking historical order demand data. It estimates overall labour and machine hour capacity requirements. Plans are usually done on a weekly or monthly period.

Total Capacity Hours Calculation

Total Capacity Hours = Standard Hours / Unit * Number Units Required

Worked Example

Product A = 1 hour standard time / unit

Product B = 2 hours standard time / unit

Next Month's Schedule:

Product A = 1000 Units

Product B = 500 Units

Total Capacity Hours

Total Hours = (1 x 1000) + (2 x 500) = 2,000 hours

Work Centre Capacity

Work centre capacities are calculated using historical data over how labour has been split across work centres.

Work Centre Example

Work centre 100 (25%) = 500 hours

Work centre 200 (50%) = 1000 hours

Work Centre 300 (25%) = 500 hours

Capacity Bills

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This method is similar to overall factors, it's still a rough estimate capacity plan but it takes into consideration standard times for each product at each work centre. This give a more accurate plan of the capacity at each work centre.

In the example below, the total capacity hours for the business remains unchanged from the previous example at 2,000 hours. But the capacity required at each work centre can change dramatically dependent on the product mix, in this example all work centre hours have changed significantly.

Example Standard Times For Each Work Centre

	<i>Standard Hours / Unit</i>		
	100	200	300
Product A	0.3	0.6	0.1
Product B	0.6	1.0	0.4

Worked Example

	Qty	100	200	300
Product A	1000	0.3	0.6	0.1
Product B	500	0.6	1.0	0.4
Work Centre		600	1,100	300 hours
Capacity Hours				

Total Capacity = 2,000 Hours

Calculation details for Work Centre 100 =
(100 x 0.3) + (500 x 0.6) = 600 hours

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Resource Profiles

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How It Works

Resource profiles takes the capacity at each work centres, and adds in time scheduling.

The benefit of this is you get more accurate capacity planning per workstation, Capacity Bills will probably lead to you under utilise your work centres. Resource Profiles will make it more likely to get more accurate capacity understanding for each work centre. So it will enable you load them more effectively.

It's a more complex calculation and it does require more data going into it, to understand what the scheduling should be. But the benefit would be it can help you more effectively utilise your work centres.

Worked Example

Work Centre	Capacity For Each Week		
	1	2	3
Product A			
100	100	50	100 hours
200	0	200	100 hours
300	0	100	100 hours
Product B			
100	75	100	50 hours
200	0	150	200 hours
300	0	0	60 hours



Capacity Planning Requirements

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Capacity Requirements Planning (CRP) is quite different to the first three methods. Whereas the first three methods could all be done in a spreadsheet, CRP is a much more accurate short term forecasting method, using live data from an MRP system.

It's based upon the same type of calculations that are used in Resource Profiles, but it takes much more data. It will take into account from the MRP system about sales orders for products and orders placed for materials required for manufacturing.

It will also take into account available stock, and reduce the capacity plan accordingly. So, for example, if there's some components that have been built to stock and they're immediately available, it will discount the need to plan to manufacture those.

So it's a live, real time calculation and it can lead to much more accurate schedules and forecasts down to a daily or weekly schedule so it can give you much more accurate results.

When to use it?

When you've got an up to date MRP system and it looks like there's potential to further optimize and you're looking for that next stage improvement.

To get your work centres and your factory optimized, and to start bringing your lead times down and your machine and your labour utilisation up.



Production Scheduling Methods

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Simplest,
Least Accurate

**Finite
Production
Scheduling**



Most Complex,
Most Accurate

**Advanced
Production
Scheduling**



Finite Scheduling

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How It Works

This leads on from capacity requirements planning. It's a technique of taking all of the orders in the MRP system and trying to load them into based on the master production schedule and basically load them into all of the works orders to come up with a detailed production plan for the whole factory and for every single worker, workstation within that factory, down to every day.

So it gives you a full utilization and a full usable plan to manage your factory day by day, week by week.

If your capacity plan, tells you that you're under or over utilized, it won't really do anything to help you with that.

So it's up to you to go in, if you find that there's a under-utilisation problem and that you have too many orders to be completed this week, but you don't have that capacity, then it will just slot those orders in for the following week or times in the future. That may lead to those orders becoming being completed after their due date.

It will be up to you then to go back into the system and increase capacity by maybe running some overtime shifts or re-ordering production to manually move things around.

But finite production capacity scheduling will slot, take your capacity plan and live orders then as and when it sees capacity for them.



Advanced Production Scheduling

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Advanced Production Scheduling (APS) is most useful when there are complex Bill of Materials (BOM's) to be handled. When products in a manufacturing company are reliant on sub-assemblies and sub-components that are also manufactured in-house. They have their own BOM's and routings and that may go down, one, two or three levels.

Having a system that can drill down and expand all of that is where Advanced Production Scheduling systems, come in.

Finite planning systems, struggle with that, they can only get around that challenge by adding in extra time or by adding extra capacity at certain work centres just to account for that.

But advanced production scheduling systems will drill down into the full Bill of Materials, expand it all out, and then come up with a detailed plan.

It's quite comprehensive, it's quite complex, there's not much room for error, but there can be potentially massive upsides to it.

It's been demonstrated that lead times can be reduced by about 85 percent by using an advanced production scheduling system in situations like this where there's a complex bill of materials, so there can be massive benefits for using it.



Ready to Ramp Up?

Next Steps

Using the strategies in this guide will help you to plan how to implement a Capacity Planning System in your factory and improve productivity.

By choosing the right method for your business, you'll have the techniques in place to manage a widely experienced team, and to help them consistently deliver world class quality products at high productivity levels.

If you don't implement the strategies I've outlined in this guide, you'll be stuck making decisions on instinct rather than real data, and firefighting issues that come up every day.

If you'd like help setting up a system like this, and having a software solution that can automatically control and track manufacturing capacity across your business, leaving you time to focus on business strategy.

Let's bring that vision to life.

Book a free **Digital Strategy Session** with us.

Together, we'll chart the most effective path to elevate your manufacturing prowess.

Ready to take the leap?

Click here to schedule your call.

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