



TRANSFORMING MANUFACTURING SCHEDULING THROUGH BETTER MID-TERM PLANNING



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Introduction

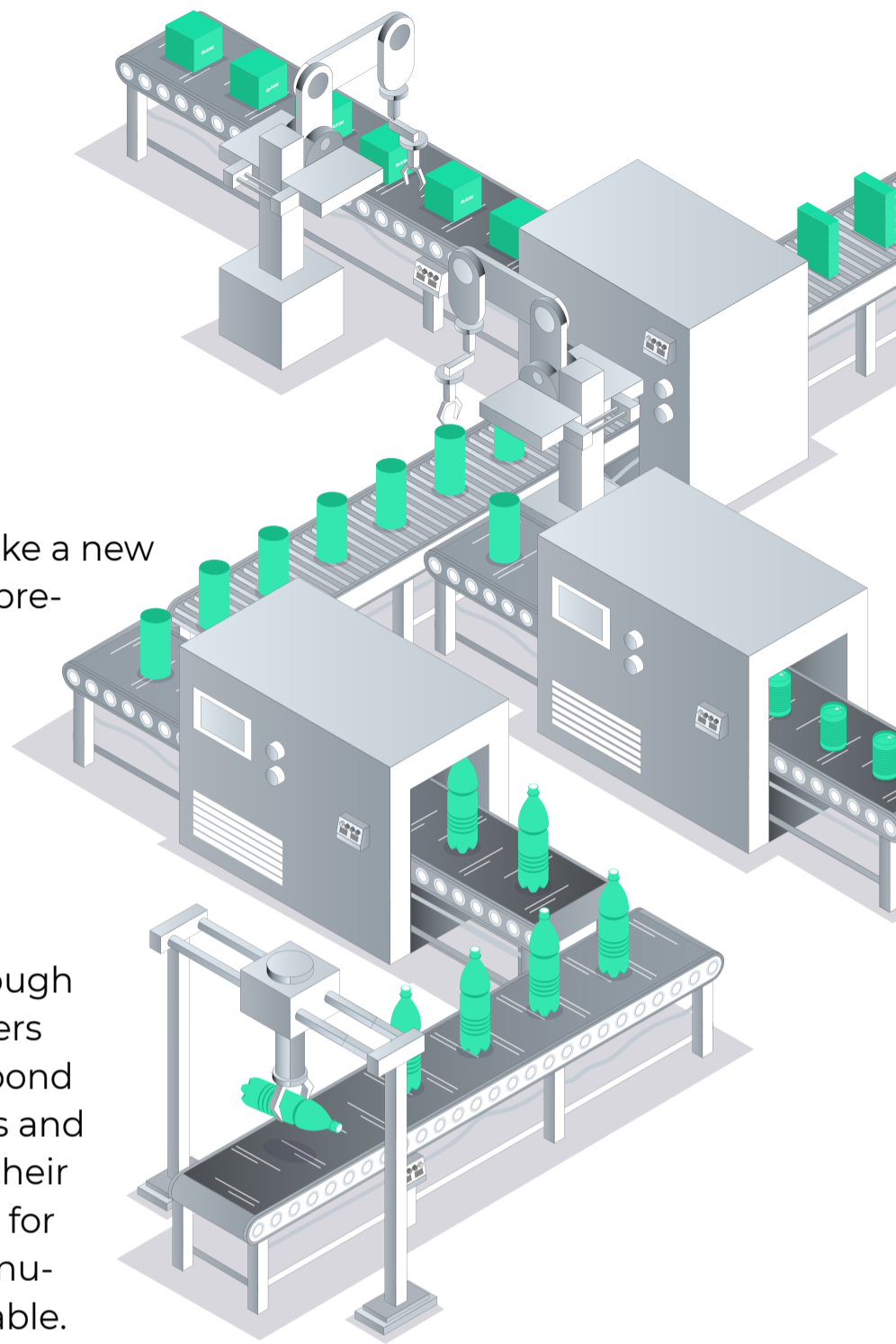
For supply chain practitioners, every day feels like a new firefight, with fresh hotspots flaring up before previous ones can be fully extinguished. Whether it's fluctuating order mixes, varying lead times, labour shortages or once-in-a-century weather events and pandemics, there's never a dull moment when it comes to keeping the wheels of production turning.

As a myriad of external shocks is sweeping through every corner of today's supply chain, practitioners are under immense pressure to accurately respond and forecast the demand, de-risk supply chains and increase capacity. With customers drumming their fingers on the table, professionals are grasping for more visibility, whilst trying to perfect their manufacturing scheduling so that it remains executable.

At this moment in time, many are realising how complex their supply chains are and how that complexity could be stopping them from developing the much needed agility. The disconnected business processes, organisational and data silos and old-fashioned technologies are now all coming to the forefront as main challenges hindering the ability to make informed, timely and accurate decisions.

And time matters in the face of disruptions and the current volatility, but all too often, putting out short-term fires means pushing mid-term planning down the priority list. Whilst planners must respond quickly to the immediate issues, this approach will only keep igniting the embers, causing a rapid spread of wildfires across manufacturing schedules in the future.

With this in mind, this e-book explores the importance of mid-term planning, its core building blocks and the role technology plays in its improvement. It also inspects why focusing on tactical planning will help supply chain practitioners reduce the number and magnitude of firefights and hammer-drops in the scheduling and execution time-horizon.





Four main firefighting causes currently impacting manufacturing scheduling

#1 Demand variation

The currently disruptive market volatility and general global uncertainty is causing planners and manufacturers to experience high demand variability. This is impacting their ability to produce accurate forecasts as lead times are getting longer. What used to take a few weeks, now takes a few months – an enormous change that needs to be reflected at the planning stage.

“In the last 12 months, we’ve seen the demand variation explode. Customers are varying from forecast by 15-20% and we’re struggling to separate the actual demand from expected. They’re also ordering much further in advance; used to be 4-6 weeks ahead, but now it is up to 4 months ahead. On top of that, customers are unexpectedly increasing demand for substitution products where alternatives stock out.” – Demand planner from multinational contract manufacturer

#2 Shortages of raw materials

Because of post-pandemic demand variations, Russia's invasion of Ukraine and extreme weather events, supply chains are being severely affected by the shortages of raw materials, from grains, oats and oil to critical minerals, metals, paper and medications. Inconsistent supplies are having an enormous impact on prices and scheduling, forcing businesses to place orders much further in advance to prevent them from running short. Some are having to be more flexible and search for alternatives and substitutes which might be less in demand.

“Rolling lockdowns are playing havoc with availability and planning. There's a high level of uncertainty and shifting information from suppliers. We're caught in a perfect storm of unpredictable demand and supply. We try to order some raw materials much further in advance to secure stock but it is particularly challenging for short shelf life raw materials and I'm trying to manage safety stock as a % of demand.” – MRP controller

#3 Key person dependencies

Relying on the skills and knowledge of a single person to carry out manual processes is almost inevitable. The more technical the task, the more likely is that you have an individual that you're dependent on to carry it out. Losing that person always leaves a gaping hole in an organisation. Adding the current labour shortages, key-person risk can easily amplify and cause disturbance to planning continuity, productivity, and ultimately, profits.

“We're struggling to find good planners who can understand the complexities of our business and our Excel-based planning process. It takes over six months to train a new planner. Our current planners focus on the short-term as they don't have the time or experience to look at the mid-term. While planners are responding to one major change, ten others have happened and so they have to start again.” – Supply chain planning manager, plastics company

#4 Rising energy costs

The current energy crisis is having a tremendous impact on manufacturers and their ability to schedule production in an accurate manner as businesses are facing a real risk of shutting down entire plants, significantly reducing production and making redundancies. The recent Make UK study found **60% of manufacturers already consider the increased energy costs threatening to their business**. Whilst waiting for government support, supply chain practitioners have been planning with a reduced energy consumption in mind to keep afloat during the next few months.

“Energy costs have gone up anywhere from 50-350% in the last year. We're doing everything we can to improve efficiency but it feels like we're losing the battle. We're concerned about having to start planning for energy usage restrictions but we have no idea how to work that into our already over-constrained plans.” – Operations executive, glass manufacturing



The three musketeers: near, mid, and long-term planning horizons

Supply chain planning generally exists on three key levels: near-term (operational), mid-term (tactical), and long-term (strategic). Collectively, they make up a planning funnel.

The near-term is concerned with what is to be bought, made, moved, and sold immediately. It deals with SKUs, part numbers, days-to-seconds level of specificity for the systems and humans to execute in the supply chains.

The long-term deals with big impact investments and decisions on how to structure and configure a supply chain to best meet the organisation's objectives. Some examples of these kinds of decisions include new investments in lines or machinery, a new canning line, or new distribution

centres to support moving finished goods closer to faster growing markets. Strategic planners usually work with very high levels of information and data abstraction and are forced to make significant assumptions around external factors (economy, competition or technology) and internal factors (product lifecycles, facility location, capital and inventory investments).

Mid-term planning carries the burden of effectively bridging the planning gap between long and near-term. The ultimate success of the near-term planning and execution disproportionately rides on how well mid-term planning has been able to 'step down' all the ambiguity and assumptions resident in long-term planning down to an acceptable level of specificity.



The importance of mid-term planning

Mid-term planning carries two critical responsibilities. Firstly, to identify, alleviate and allocate constraints effectively. Secondly, to establish the inventory operating boundary conditions (safety stock and max stock).

These constraint and inventory decisions become the operating limits within which the near-term plans must exist. Near-term scheduling will typically account for a period up to four weeks into the future. As a result, planners rarely have the ability to secure more capacity or more inventory in the near-term planning horizon in which they operate. This is why mid-term planning carries a disproportionate burden to 'get it right'.

Unforeseeable volatility is unavoidable. However, operational planning can help manufacturers be better prepared and

respond in a timely manner with lesser effort. Most supply chain planners are currently so focused on putting out short-term fires and addressing problems like demand, material and capacity changes that they simply don't have the time to see the issues as they come over the horizon. But if they did, they could still have the runway to deal with them.

The irony is that tactical planning or mid-term planning can significantly reduce when and how much a planner is caught by surprise by normal business variability. This frees up time to think and act in a more analytical manner, and also reduces the impact of business variability.

**MOST SUPPLY
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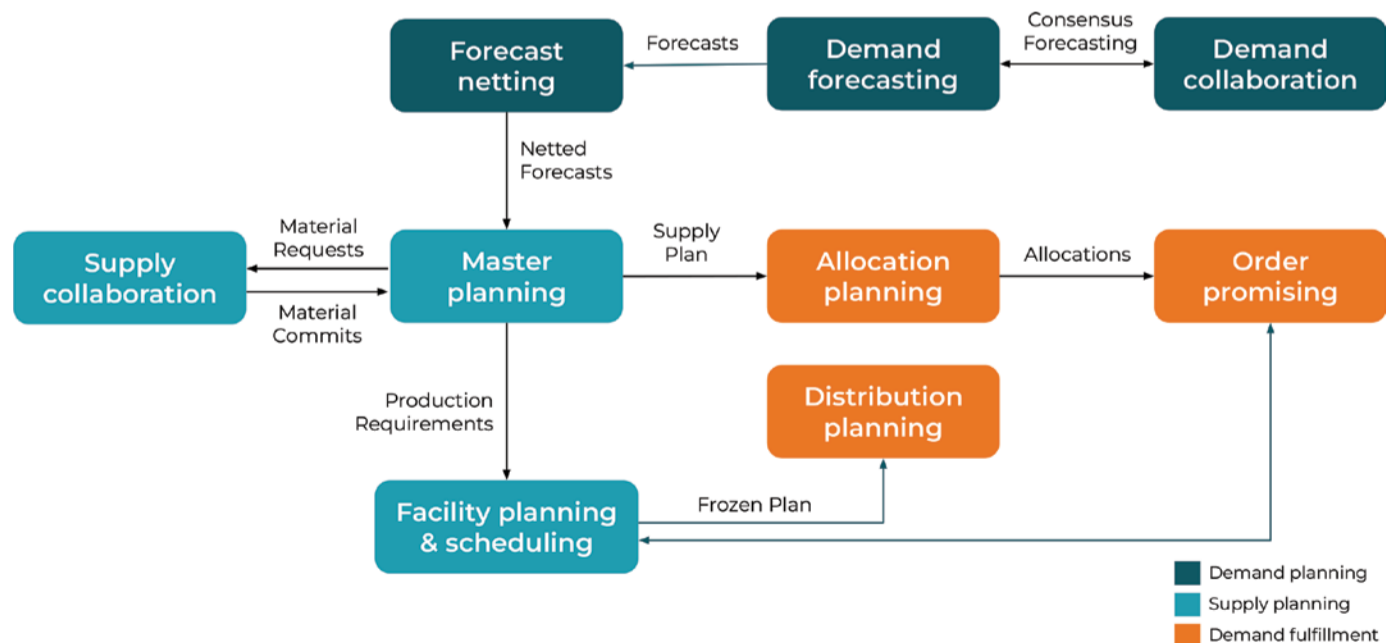


Getting the mid-term planning right: three building blocks

#1 Group Planning

Group Planning is a transformative planning approach designed to simplify mid-term data so planners can quickly identify and manage capacity constraints in the mid-term planning horizon.

Planners can begin with SKUs and part numbers and quickly assign them into groups based on attributes such as colour, bottle size, pack size, chemistry, to name a few. Subsequent planning and



This graph shows a typical tactical supply chain planning process

optimization algorithms take this grouping into account while identifying, alleviating or allocating capacity and inventory constraints. However, most ERPs and planning tools don't support group planning.

By aggregating SKU-level demand — both forecasts and orders — based on planner-controlled demand groups, it declutters planners' worklists and helps them focus on the true bottlenecks. By allocating constrained capacity and inventory targets to demand groups instead of individual

#2 Process frequency

The demand planning and supply planning processes are usually exercised on a monthly basis, although sometimes weekly. The facility scheduling portion of the process is often exercised daily.

Allocation planning is often done on a monthly basis, and updated weekly, daily

#3 Process time-horizon

The demand planning and supply planning processes, and allocation planning, usually cover a time horizon from current-month + 1 through current-month + 18. The total length is usually a function of the end-to-end lead-times involved in the industry, including procurement lead times. The longer the lead-times, the higher the number of months to be planned.

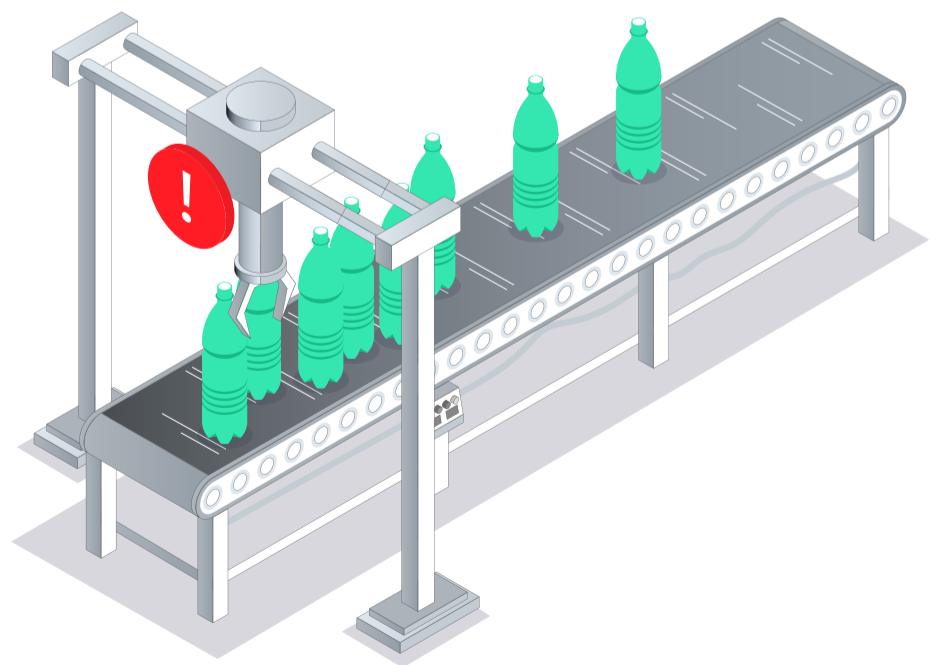
The facility scheduling as well as distribution planning portion of the process usually covers the current month or current week + 2.

SKUs, it increases plan stability and reduces variability caused by SKU-level demand shifts over time. Incorporating production realities such as production wheels and yields makes the resulting mid-term plan more realistic.

The result is increased plan stability, capacity utilisation and throughput — all helping to reduce gaps between plans, schedules and execution. That means less firefighting on the part of schedulers, allowing them to be more forward-looking.

or sometimes even in real-time, depending upon how frequently order promising and supply planning is run.

In general, the more frequent the process, the more agile the organisation is in detecting and responding to changes in the business environment.





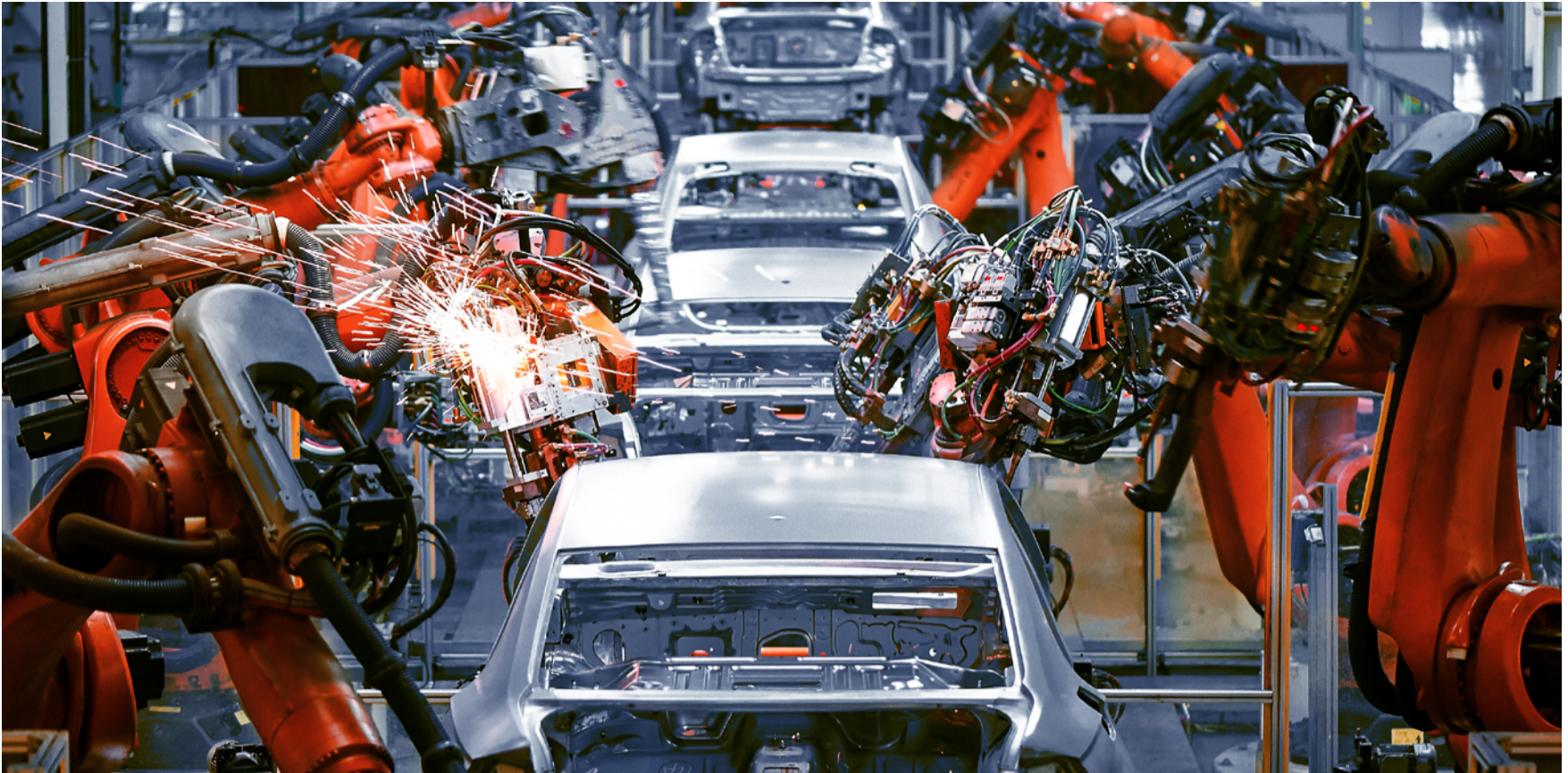
Mid-term planning challenges

Current planning techniques, processes and systems often force mid-term planners to use the same level of SKU and part number specificity used by their near-term colleagues. This results in mid-term planners having to deal with several challenges.

Firstly, the rising volumes of data are making it harder for planners to hone in on true capacity problems in the supply chain by bogging the planners down in detail. Secondly, demand at the SKU-level in the mid-term horizon tends to be highly variable from one planning iteration to the next.

In addition, current variability creates a sense of constant change, which planners struggle to understand and explain to stakeholders, including their near-term planning colleagues who rely on the accuracy of the mid-term plan. Production and capacity realities such as product transitions and changeover time and costs also often go unaccounted for.

All of these hurdles add to the instability in the resulting mid-term plan. Ultimately, more instability results in more gaps between schedules, more replanning, less confidence and poor adherence to plans.



The role of technology in improving mid-term planning

Many manufacturers are still heavily reliant on manual, Excel-based processes as the good old tool is both accessible and inexpensive. However, when it comes to maximising value and optimising production plans, it begins to fall short. Considering the current external shocks and firefighting causes impacting mid-term scheduling, relying less on Excel and more on modern technologies like intelligent automation and artificial intelligence (AI) can be the antidote that every manufacturer needs to weather the storms of today and tomorrow.

Adopting newer solutions isn't easy, neither is change. However, **embracing the right technology can significantly help implement more robust, mid-term planning processes and reduce key person dependencies**. Seamlessly connecting with organisations' ERP and planning systems,

new solutions with a detailed digital twin can automatically capture the realities of manufacturing lines and manage business logic, constraints and goals quickly and easily. This will help to avoid adding extra complexities as well as silos, and empower planners to simulate at will, delivering results in minutes.

Innovative technologies, such as intelligent automation tie various enablers together, helping to relieve planners of clunky processes and mundane tasks and empowering them to make more confident planning decisions. This confidence is needed to make a real difference and respond to today's risks and opportunities promptly. By arming themselves with technology like this, manufacturers can reap the benefits of more dynamic, agile and resilient supply chains.

Streamlining manufacturing scheduling

Just as new global events occur, manufacturers should shift their focus towards mid-term planning as it can bring enormous benefits to all corners of the supply chain. Whilst the natural instincts are guiding planners to prioritise short-term scheduling, changing the approach towards the mid-term will help gain earlier visibility into possible demand and supply disruptions. This will make planners more ready and responsive when dealing with new, unexpected hotspots.

With the adoption of innovative technological solutions, planners and manufacturers

can become more forward-looking, analytical and devote more time to create optimal schedules and maintain a virtuous cycle. Streamlining mid-term planning also helps improve organisation alignment and accountability as when more collaborative planning process takes hold, everyone has greater visibility to each other's data and assumptions. As such, manufacturers can expect better business outcomes, with savings in inventory, greater capacity utilisation and throughput, improved customer fill rates, and schedule adherence.

About Replan

Replan is a supply chain planning company on a mission to redefine the planning process. Its cloud-based production planning

software helps manufacturers navigate disruption and reduce costs through automated production planning optimisation.



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