

DEMAND PLANNING IN THE NEW NORMAL

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1. INTRODUCTION

The new coronavirus (Sars-CoV-2) pandemic represents one of the greatest health crises ever experienced and its economic impact is being compared to those caused by the 1929 market crash and the post-World War II.

Due to virus characteristics, such as a high Transmission Rate (R_0 between 1.5 and 3.5) and a high Case Fatality Rate, combined with the absence of clinically approved antiviral drugs or a vaccine against COVID-19, the adoption of social isolation was an immediate and essential solution to prevent an uncontrolled spread of the disease. Without that measure, health systems would overburden and cause an exponential increase in deaths. As a result, non-essential services had to shut down, forcing people to work from home and consequently radically changing their consumption habits.

For demand planning, which is intended to balance the demand flow with the available capacity, the “New Normal” posed a great challenge:

- on the demand side, the consumption of some products and services has spiked, such as hygiene products and home deliveries, while others, there has been an abrupt drop in sales, such as air travel. In this new scenario, the use of traditional algorithms for sales forecasting is inadequate to efficiently predict demand considering the high uncertainty and variability;
- on the capacity side, the closure of manufacturing sites to prevent the contagion and the supply interruption caused by supply chain problems lead to unavailability and limitation of capacity to meet the demand. This condition brings even more uncertainty to the planning process.

Therefore, it is crucial the review the demand planning process and identify the aspects that need to be adapted during and after the pandemic in order to minimize the problems and costs due to planning errors.

The purpose of this article is to understand the changes caused by the pandemic and the perspectives and trends that may affect the tactical planning process in the future.

2. ADJUSTMENTS TO THE DEMAND PLANNING PROCESS

The tactical demand planning process, known as Sales & Operations Planning (S&OP) or Integrated Business Planning (IBP), has generally a five-step monthly process:

- I. Sales forecast: historical demand data are analyzed to project future sales using mathematical models;
- II. Demand Planning: Sales Forecast output is combined with updated information from sales and marketing areas regarding promotions and marketing initiatives planned by the company or by its competitors;
- III. Capacity Planning: manufacturing, warehousing, inventory and transportation areas analyze the availability of resources, stock position, freight costs, production scheduling, and so on;
- IV. Pre-S&OP Meeting: different areas discuss and seek consensus on the demand plan and its financial implications;
- V. Executive S&OP Meeting: the company's executives assess the trade-offs and make the final decision on the demand plan for the next periods, which then will be deployed in operational plans.

During the health crisis, the traditional planning process is inadequate for several reasons, among which:

- the monthly planning horizon does not consider the variability of demand in the very short term, caused by the irregular advance of the epidemic and the governmental actions taken to prevent it;
- it is impossible to identify peculiarities regarding the impact of the epidemic on specific products and regions from grouped data often used in this process;
- uncertainties in demand affect the accuracy of the projections made by the sales forecasting algorithms;
- operational capacities also carry uncertainties since they could suddenly be shut down due to coronavirus infection. It could affect factories, distribution centers or supplier operations, interrupting the supply chain.

Thus, it is necessary to make some adjustments to the process during the pandemic and define specific criteria to return to the regular process after the social isolation period.

2.1. During the Pandemic

During the critical period of the pandemic, with social isolation and restrictive measures taking place, it is very difficult to estimate a reliable demand for one or more months ahead. So, the monthly process changes completely as it now must define the strategic alignment and update the executives about the operational activities.

In addition, the weekly planning process, known as Sales & Operations Execution (S&OE), gains importance and becomes the decision-making process to meet demand. It needs to work as a “war room”, promoting the daily decisions adjustments, based on the most recent information available.

2.1.1. Monthly Process

During the pandemic, the monthly process is inadequate to support decision-making and plan alignment because there are frequent and intense changes in progress that requires quick actions and adaptations. Consequently, the monthly process is used to inform the company’s executives about the decisions taken during the month and to ensure strategic alignment, directing the operational actions of the following month.

Within the relevant discussions in the monthly process, it should be highlighted:

- product portfolio review: since there were significant changes in consumption habits, it is important to understand impacts such as changes on packaging formats. In addition, the adjustments in operational capacity to reduce costs and adapt to low demand cause trouble to manage a very broad portfolio, forcing companies to momentarily focus on a product mix that brings high turnover and profitability;
- changes in sales channels: with the closure of traditional commerce and social isolation there was an increase on online sales and new logistical services, such as delivery from physical stores and drive-thru systems for product pickup, requiring adjustments and operational adaptations;
- order-taking mechanisms review: companies with direct sales were the most affected since contact restrictions prevent the salesperson from visiting his or her clients. That leads to the development and use of other platforms, such as WhatsApp, Apps and telesales.

All the mentioned topics require top management attendance and must be evaluated in monthly meetings (Figure 1). These meetings should bring data on operational, financial and planning process performance, supported by indicators and reports from the teams involved.



Figure 1 – Monthly Process focused on strategic alignment and top management reports. Source: ILOS.

2.1.2. Weekly Planning Process with Daily Adjustments

The weekly planning process, focused on W1, becomes the main forum to calculate the demand forecast and to discuss operational adjustment actions, such as production schedule. In addition to the regular activities of this process, it is necessary to establish a “virtual war room”, or “War Zoom”, to analyze the latest information available and to adjust daily decisions.

This “War Zoom” requires a senior and multidisciplinary team, empowered by the company's executives, to make decisions without the need of consent from top-tier managers. During the pandemic, information from commercial and trade marketing teams becomes essential in the decision-making process as sales forecasting algorithms are not accurate (Figure 2).

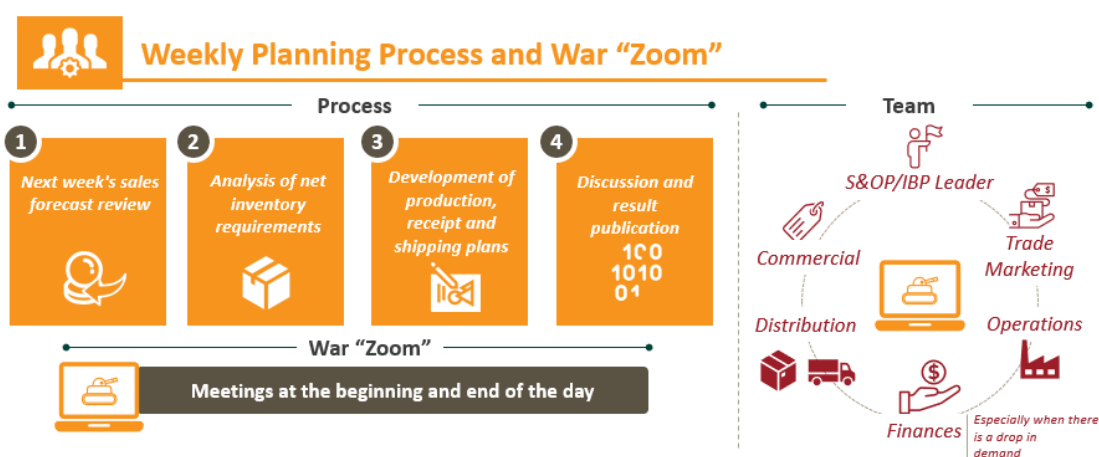


Figure 2 – Weekly Planning Process, with daily adjustments and a multidisciplinary team. Source: ILOS.

The data availability and the team’s technical skills play a significant role on the analysis and its quality. Either way, it is crucial to connect information related to the COVID-19 updates, such as contagion curves and number of cases per region at the most granular level as possible, with sales and commercial information, such as locations, operating business and updated demand data.

For example, in figure 3, a comparison of two regions (A and B) is presented with an estimate of the effective reproduction number (R_t) and the product Y demand. Comparing to the region A, the region B is at a less advanced stage of the disease, when R_t is higher and demand still shows a downward trend. Therefore, it is possible to project demand and R_t behavior in region B for the next days/weeks, by using region A as baseline, since it is at a more advanced stage of the epidemic. In addition, it is important to evaluate variables determined by commercial areas, such as points of sale operations and re-opening expectations.

Replicating observed behaviors

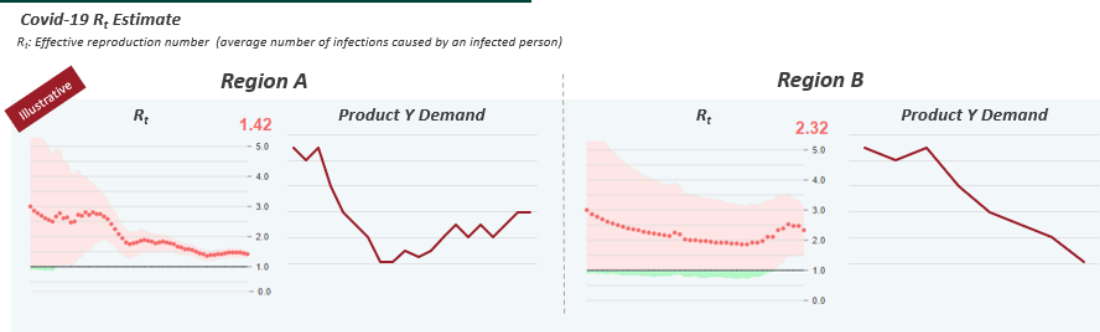


Figure 3 - Contagion curves, demand behavior at each stage of the disease and granular commercial inputs assist in “looking to the future” planning. Source: Loft, ILOS.

It is also important to define what the companies should prioritize. On one hand, if the demand has dropped, it is important to focus on efficiency, since service’s costs must be minimized. On the other hand, if demand has abruptly increased and is challenging existing capacity, effectiveness is the priority, since the organization must review the available resources in order to maximize service capacity. In addition, it will be essential to ensure the continuity of operations, defining health and safety protocols and making adequate PPE available to the operational teams, in order to prevent the spread of the virus and ensure that the operation is not interrupted.

Considering capital cost reduction in Brazil, inventory increase could be an interesting alternative in capacity management to meet the demand in the post-pandemic. As many companies had to shut down part of their operation to reduce costs, the product availability will play a key role on market share growth and fast recovery during reopening stages.

Figure 4 presents a summary of the weekly planning process highlights for demand and capacity.



Figure 4 – Weekly Tactical Planning Process, with daily adjustments. Source: ILOS.

2.2. Post Pandemic

After the most critical period of the pandemic and the social isolation impacts, it will be important to adjust the data on past sales, eliminating outliers for future projections. In addition, companies must accelerate process improvements that were already planned.

So, the first question to ask is: when should we adjust the series and resume the regular demand planning process?

An efficient recommendation is to track the daily demand coefficient of variation (CV). The coefficient of variation, an indicator of the demand curve variability, is the ratio between the standard deviation and the average demand. During the pandemic, it is expected a considerably increase on the CV driven by an increase on the demand variability. As this indicator returns to its pre-pandemic results, it should be possible to adjust the baseline and resume the regular tactical planning process (figure 6).

2.2.1. Demand Time Series Adjustments

To adjust the data series baseline, it is important to understand its systematic components - level, trend, cycle and seasonality - and how they can be affected by the pandemic impacts, as shown in the summary presented in figure 5.





Level		
	Timeless, stable and related to Market-Share.	Increase or decrease may occur depending on the segment. Ex: Sanitizing products
Trend		
	Long-term projection related to the growth / decrease of a market.	Greater or lesser slope of the growth curve for some sectors. Ex: Online sales and airline tickets
Cycle		
	Related to business cycles. They occur, in general, in periods between 3 to 5 years.	Covid-19 may accelerate the start of a macroeconomic recession
Seasonality		
	Known variations within the year. Related to seasons and / or commemorative dates	Very affected by the pandemic, which will distort the expected seasonal behavior

Figure 5 - Components of the sales series and possible pandemic impacts. Source: ILOS.

In the short term, two components that will need adjustments are the series' seasonality and level. How to do this?

In order to adjust the seasonality, it is mandatory to calculate the seasonal factor of the period with the greater variation, such as March/20, April/20 and May/20, and compare it with the historical regular index of those months. This will allow to understand the variation and apply the proper compensation, as illustrated in Figure 6.

The rectification of the level component will depend on the new sales level without social isolation, as it is expected a change in the consumption pattern of certain products, categories and segments. For example, sanitizing products had an abrupt sales increase due frequent cleaning care and may remain in a higher sales level when compared to the pre-pandemic period, as people will be more concerned about hygiene. In this case, there is an increase on the

sales level, and it will be necessary to quantify the difference to adjust the baseline, as shown in Figure 6.

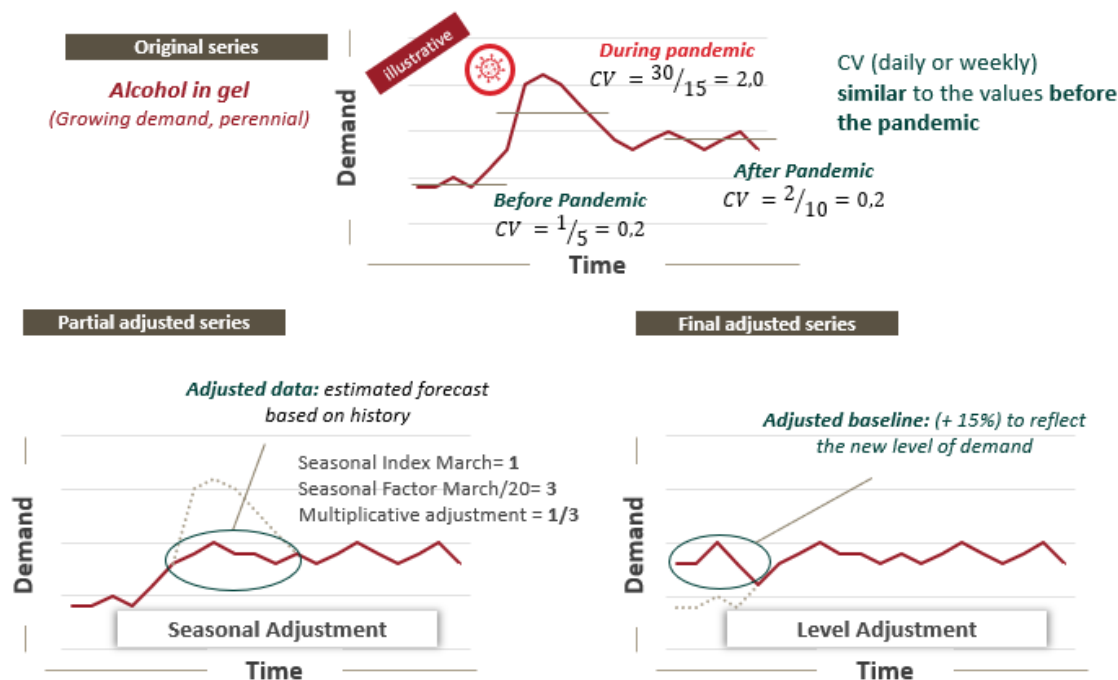


Figure 6 –Baseline adjustment for products whose demand was affected by the new coronavirus.
 Source: ILOS.

2.2.2. Tactical Demand Planning Process Trends

Considering the post-pandemic trends on tactical demand planning process, five transformations were already planned, but are expected to be accelerated: (i) adoption of artificial intelligence technologies and machine learning, (ii) greater presence and commitment of commercial teams in the planning process, (iii) collaborative process implementation, (iv) intense adoption of robust risk management processes along the chain and (v) greater presence of financial teams in planning decisions.

Although artificial intelligence and machine learning technologies were not able to anticipate the pandemic impacts on business demand, it becomes even more evident that the usage of exogenous variables and rapid forecasts adjustments creates significant advantage in highly uncertain scenarios. Thus, the idea of augmentation and automation of these technologies makes them an inexorable trend for the future. Academic and specialized literature, as well as publications from major strategic consultancies, indicate an extensive use of AI in the future of Supply Chain Planning.

The greater contribution of the commercial and trade marketing teams in the planning process should also be a trend, given that the crisis highlighted their importance when the accuracy of sales forecast models is relatively low. The alignment of commercial initiatives and the quick response to uncertain events is often more important than trying to predict future demand. In order to accelerate the commercial engagement, two actions could be put into practice: reinforce their importance and use metrics to evaluate its contribution in the process.

To overcome the economic crisis, collaboration with business partners will certainly be required to reorganize the supply chain. Thus, collaborative planning, as in Collaborative, Planning, Forecasting and Replenishment (CPFR), or supply chain finance practices, such as consignment of stocks and collective financing, should be adopted more intensely. During the pandemic it was observed initiatives of partnership between industry and small/medium retail, in order to mitigate the financial difficulties caused by social isolation on the weakest players in the supply chain. Those partnerships must expand in the post-pandemic.

The pandemic also exposed the fragility in some supply chains, impacted by the vulnerability of their suppliers and customers. Purchase decisions based exclusively on economic aspects must be reviewed. Companies must incorporate an active Risk Management process in the demand planning activities, identifying the risks for meeting market demand in a broad sense.

Finally, the cooperation of financial teams in the planning process will be fundamental. Not only to translate the operational plans into a financial language, essential in a scenario of economic crisis, but also to closely monitor the process performance and to structure financing mechanisms for the supply chain partners.

3. EXPECTED CHANGES ON DEMAND DIMENSIONS

The pandemic will result in new consumption habits, either due to reduced income, which forces consumers to seek products and services with a better benefit-cost ratio, or due to new sales experiences, such as e-commerce sales. In addition, categories related to hygiene and health must permanently maintain a higher level of demand, as seen during the pandemic.

E-commerce will undoubtedly be the most affected channel in the post-pandemic in Brazil. Several companies had to quickly adjust their operations to fulfill online orders and consumers had to learn how to shop online. Although the e-commerce sales have been growing in recent years, when we compare Brazil with other countries like China and the United States, there is still a lot of room for growth. In percentage terms, e-commerce in Brazil represents 4% of retail sales, while in the USA this index is 11% and in China, 25%.

Another channel that is expected to expand in the post-coronavirus period is the Cash&Carry. Since 2004, Cash&Carry has shown a consistent double-digit growth. During the pandemic, there was an 8% growth comparing march/20 over the same month in 2019. The income reduction and the financial crisis caused by the pandemic should attract even more consumers to this channel, where price is a key factor (Figure 7).

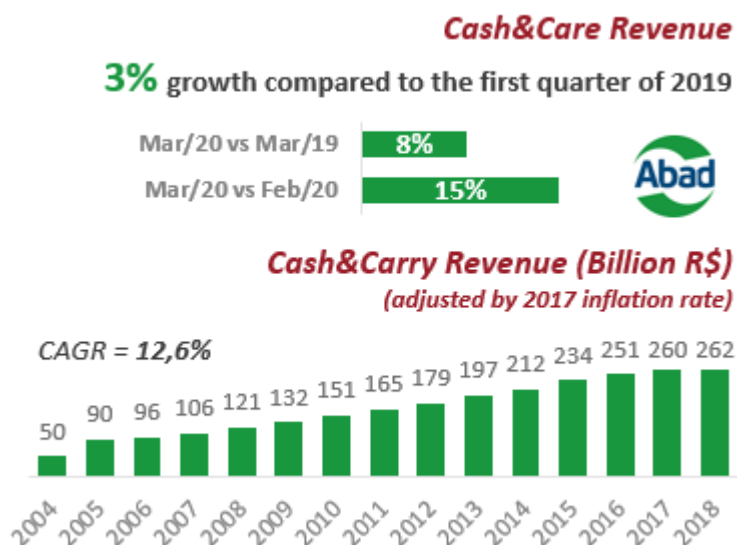


Figure 7 – Cash&Carry growth before and during the new coronavirus pandemic. Sources: ABAD (Brazilian Association of Cash&Carry and Distributors); ILOS.

We can also expect a change in packaging formats, with greater preference for family packages, refills and returnable packages, due to the better benefit-cost ratio for consumers. Besides the fact that, in recent years, some companies have been reducing the size of packaging in order to increase product profitability, during the early weeks of the quarantine it was already possible to note the increased sales on bigger packages products, as large companies experienced an abrupt drop in the total volume of sales, but a growth on family packaging sales. This behavior has already been observed in other economic crises.

These changes encourage companies to implement a Consumer Centric approach, focusing on the consumer needs – what channels, segments and types of packaging they prefer. With that approach it will be possible to structure organization’s resources to meet consumer needs. On demand planning, a collaborative initiative, with trade marketing and commercial inputs, helps the company to place the consumer at the center of demand plans discussions, making their desires and needs the main driver for decision making.

4. CONCLUSION

The new coronavirus brought an enormous challenge to demand planning processes. Reorganizing the processes and understanding the necessary changes regarding planning horizon and information granularity are the first steps to adjust the process during the pandemic. It will be essential to understand how different regions have been impacted by the spread of the virus and which containment measures were adopted. Relationships between demand and the stage of the crisis in each location are important to make inferences about future behavior.

It will be extremely relevant to create a "War Zoom" and connect commercial, production, logistics, trade marketing and financial teams in order to update the forecast planning on a daily basis, given the rapidly changes that impacts consumption. The speed for decision making will be king, while information gathering will be queen, to make the best possible decision in a period surrounded by uncertainty.

It is important that the monthly process keeps happening, but addressing different topics such as: strategic alignment, reports presentation, product mix definitions, sales channels and order taking.

Finally, the post-pandemic planning will be essential for the company to minimize losses due to the crisis impacts. Understanding the moment to return with the monthly planning process, making the appropriate baseline adjustments and placing the consumer at the center of the decision-making process will help companies during difficult times.

All companies will have scars from the crises, but it is important to focus on minimizing impacts and learn from the challenges they faced. It is expected that scientists will be able to advance in the development of medicines and vaccines and that companies will be back, as soon as possible, to their normal activities, perhaps with a renewed and better structured planning process.

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