
ANALYSIS OF CAPACITY MANAGEMENT IN ADDRESSING PRODUCTION OVERLOAD IN A SNACK FOOD COMPANY

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ABSTRACT

This study aimed to analyse production capacity management in a snack food company in dealing with production overload, particularly during high-demand periods such as Christmas, New Year, and Eid. This research used a descriptive qualitative approach with semi-structured interviews consisting of ten questions addressed to employees in the production, operations, and warehouse departments. The questions covered capacity adjustment strategies, overtime policies, recruitment of additional workers, raw material management, production constraints, quality supervision, post-production evaluation, assessment of current capacity, scheduling of production and distribution, and technology investment. In addition to interviews, direct observation was conducted to ensure the consistency between employees' statements and the actual field conditions. The results show that the company relies on historical data-based planning, workforce optimisation, and production flexibility to handle increased demand. However, challenges such as product quality, limited machinery, and time pressure remain major issues that require continuous management. These findings provide a comprehensive overview of the importance of adaptive capacity strategies in the snack food industry.

Keywords: Capacity Management, Production Overload, Capacity Planning, Snack Food Industry, Production Efficiency

INTRODUCTION

The snack food industry has experienced rapid growth in recent years, in line with the increasing consumer demand for convenient and affordable ready to eat products (Nurbaiti et al., 2023; Hanum & Rahmani, 2022). This growth requires companies to manage production capacity effectively in order to meet market demand without compromising product quality and cost efficiency (Alfarizi & Imsar, 2025). When demand increases significantly, companies often face conditions of production overload, which may trigger bottlenecks in the production line, delivery delays, and increased workloads for operational staff. This phenomenon highlights the importance of implementing well-planned and measurable capacity management

to ensure that companies are able to maintain the stability of production processes (Solehuddin & Rahmani, 2024).

Furthermore, snack food companies need to conduct regular evaluations of equipment readiness, workforce availability, and capacity planning systems in order to create a balance between market demand and actual production capability. Ineffective capacity management may potentially hinder a company's competitiveness (Aisyah et al., 2023).



Figure 1. Documentation of the Researcher with Company Employees

Source: Researcher Documentation (2025)

Capacity management is a crucial aspect in maintaining the continuity of production processes, particularly in companies operating in the snack food industry, which is highly influenced by fluctuations in demand. When available capacity is unable to meet production requirements, companies risk declining product quality, longer lead times, and increased overtime costs. The implementation of capacity planning methods, such as mapping raw (Anisa & Rahmani, 2023), estimating machine output, and evaluating the working hours of operational staff, becomes an essential foundation that needs to be optimised (Mursala et al., 2022).

However, many small and medium-sized enterprises have not been able to implement capacity management comprehensively due to limited resources and insufficient technical literacy. This condition highlights the urgency of improving capacity control systems so that companies can anticipate demand fluctuations more effectively. When capacity is not managed properly, the risk of imbalance between production and demand becomes increasingly higher (Hanum & Rahmani, 2022).

Supply chain stability is also an important factor in ensuring the smoothness of production processes, particularly for snack food companies that rely on the availability of raw materials in large and consistent quantities. An unstable supply chain system may lead to shortages of raw materials, thereby worsening the production overload conditions faced by the company. Therefore, companies need to strengthen coordination with suppliers, develop more accurate inventory monitoring systems, and implement risk mitigation strategies to address supply uncertainties.

When the supply of raw materials is disrupted, production is not only hindered but may also lead to increased emergency purchasing costs. Delays in supply often have a direct impact on the decline in production volume, which ultimately reduces the company's ability to meet market demand. Effective supply chain management can minimise the risk of declining production capacity and help companies respond to market changes more adaptively (Nurwandi, 2023).



Figure 2. Documentation of the Snack Food Company Location
Source: Researcher Documentation (2025)

In addition to supply chain challenges, snack food companies also face fluctuating demand dynamics, particularly during certain periods such as holiday seasons, religious celebrations, and popular culinary trends. When demand increases sharply, companies require flexible production capacity in order to make rapid adjustments. Inappropriate demand management may lead to a mismatch between actual capacity and market demand. Therefore, companies need to implement more accurate forecasting, optimise production schedules, and manage the distribution of workloads so that the production process can remain stable. Inaccurate demand forecasting may cause companies to experience stock shortages, production

delays, or even inventory accumulation when demand does not meet expectations. With effective demand management, companies can minimise the risk of imbalance and improve the accuracy of their production strategies (Oktalia et al., 2022).

In an operational context, machine capacity is an element that directly influences a company's ability to meet market demand. Each machine has a production limit that must be calculated precisely to prevent overloading, which may lead to decreased performance and a higher risk of damage. Evaluating machine capacity therefore becomes an important step in determining whether a company can consistently achieve its targeted output. When machine capacity is insufficient, companies may experience work accumulation, increased machine downtime, and disruptions in the production flow. To address this issue, companies need to conduct regular maintenance, add new machines, or adopt more efficient technologies. In addition, capacity planning should consider the actual workload and long-term production requirements in order to avoid potential bottlenecks. Accurate evaluation of machine capacity can significantly help companies improve productivity.

In addition to machine and demand factors, the use of supporting technologies such as vacuum sealer machines also plays an important role in increasing production capacity and extending the shelf life of snack food products. This technology not only accelerates the packaging process but also improves product quality and food safety. The implementation of appropriate production technology can help companies overcome capacity limitations and enhance operational efficiency. Furthermore, the adoption of new technology should be accompanied by workforce training to ensure that the production process remains optimal. Companies that are able to integrate technology effectively tend to have greater flexibility in anticipating production overload. Therefore, technological innovation becomes one of the key strategies for sustainably increasing production capacity and maintaining competitiveness amid rising market demand (Sari et al., 2024).

LITERATURE REVIEW

Capacity Management

Capacity management can be understood as an effort to ensure that available resources such as labour, machinery, and raw materials are utilised optimally to meet market demand. In practice, capacity management plays an important role in balancing actual production capacity with the dynamic needs of consumers. If capacity is too low, companies will face difficulties in meeting demand; conversely, if capacity is too high, it may lead to inefficient operational costs. Therefore, understanding basic capacity, effective capacity, and actual capacity becomes an essential foundation for formulating operational strategies. This concept also involves both short-term and long-term planning so that companies are able to anticipate fluctuations in demand, including during peak periods such as major holidays. Recent literature emphasises that capacity management is one of the key elements in the value chain of modern companies (Heizer et al., 2020).

Teoritis Production Overload from a Theoretical Perspective

Production overload occurs when a company's production capacity is unable to accommodate a sudden increase in demand. This condition may be caused by limited resources, mismatched production schedules, or ineffective planning systems. In operations management, an imbalance between production capacity and demand can create bottlenecks in the production system that disrupt the flow of operations and delay product delivery (Mulyadi et al., 2025). In the context of snack food companies, production overload often occurs during major holidays or festive seasons when consumer demand increases significantly. If not properly managed, this situation can lead to declining product quality, slower distribution processes, and potential financial losses. Therefore, controlling production overload requires a systematic approach through effective capacity planning, optimization of production resources, and appropriate workforce management to maintain operational stability (Soesilo & Valentin, 2025).

Capacity Planning Strategies

Capacity planning theory emphasises the importance of aligning production capacity with market demand patterns. In operations management literature, several strategies are commonly discussed, including the *level capacity strategy*, *chase demand strategy*, and *hybrid*

strategy. The level strategy focuses on maintaining a constant production capacity over time despite fluctuations in demand, whereas the chase strategy attempts to adjust capacity according to actual demand levels. The hybrid strategy combines both approaches to achieve a balance between cost efficiency and customer satisfaction. In snack food companies, these strategies can be implemented by increasing inventory before major holidays or adjusting the number of workers and production hours according to demand. This theory highlights that the success of capacity planning strategies largely depends on the accuracy of demand forecasting (Yan & Hu, 2023).

The Role of Technology in Production Capacity

The theory of technological innovation in capacity management emphasises that the use of modern technology can improve the efficiency and flexibility of production systems. In the context of the snack food industry, machine automation, the digitalisation of production processes, and the implementation of Enterprise Resource Planning (ERP) systems enable companies to respond more quickly to sudden increases in demand. This theory also explains that technology can reduce dependence on manual labour, thereby minimising the risk of overload caused by limitations in human resources. Furthermore, technology assists companies in monitoring machine performance and product quality in real time, which becomes crucial when demand increases significantly. Modern operations management literature highlights that the integration of digital technology is a key strategy for addressing dynamic market conditions (Du & Li, 2024).

Supply Chain Theory and Capacity Management

Capacity management cannot be separated from supply chain management theory, which emphasises integration among different elements within the supply chain. Under conditions of production overload, high production capacity will not be optimal without smooth distribution and a stable supply of raw materials. This theory explains that capacity should be viewed as part of a comprehensive system involving suppliers, manufacturers, distributors, and end consumers. With well-integrated supply chain management, the risks of distribution delays or shortages of raw materials can be minimised, allowing production capacity to operate according to plan. In the snack food industry, this is particularly relevant

since timely distribution directly influences customer satisfaction. Research shows that the success of capacity management is strongly influenced by the effectiveness of an integrated supply chain (Anwar et al., 2025).

RESEARCH METHODS

This study employed a descriptive qualitative approach, with the main data collection technique consisting of semi-structured interviews conducted with employees from the production, operations, and warehouse departments. The interviews were conducted to explore in depth how the company managed production capacity when facing production overload conditions. The interview instrument was structured into ten main questions, namely: (1) strategies for adjusting production capacity during sudden increases in demand; (2) the existence of overtime policies or the recruitment of additional workers during peak seasons; (3) the management of raw material stocks to prevent shortages; (4) the most common constraints encountered during production overload; (5) efforts to maintain product quality amid high production targets; (6) the company's approach to evaluating production outcomes after peak periods; (7) employees' assessments regarding the current condition of production capacity; (8) the arrangement of production and distribution schedules to maintain operational efficiency; (9) investment in machinery or technology to increase production capacity; and (10) the greatest challenges in maintaining quality when production capacity is increased. These questions were designed to ensure that all aspects of capacity management were comprehensively covered.

This research method was also complemented by direct observation of production activities to verify whether the information obtained through interviews corresponded with actual operational conditions in the field. The observation focused on daily work patterns, equipment utilisation, the flow of production processes, and employees' responses to changes in workload during peak seasons. Data analysis was conducted through a data reduction process by selecting relevant findings from the ten interview questions and presenting them in a descriptive narrative form.

To ensure data validity, the researcher applied source triangulation by comparing responses from several employees and matching them with the company's internal documents,

such as production schedules, inventory records, and seasonal demand reports. This approach ensured that the research findings were not solely based on individual perceptions but were also supported by valid operational evidence.

RESULTS OF RESEARCH AND DISCUSSION

Results Of Research

General Profile of Shafa Aneka Snack

Shafa Aneka Snack is a business engaged in the sale of snack foods and various types of cookies that has been operating since approximately 2001. Located at Jl. Bersama No. 11, Bandar Selamat Village, Medan Tembung District, the business serves customers from various areas, including the city of Medan and its surrounding regions. In its operational activities, the store offers a wide range of snack products that are popular among consumers and often experiences increased demand during certain periods, such as Ramadan, Eid al-Fitr, Christmas, and New Year.

In terms of facilities, the business is equipped with a multi-storey building designed with a self-service concept, well-organised product shelving, and an adequate parking area to support customer convenience while shopping. Overall, the store is relatively well known in its surrounding community and has maintained a relatively stable customer base over time.

Table 1. Production Capacity and Actual Demand

No.	Product	Previous Year Production	Actual Demand	Difference	Next Year Plan
1	Nastar	500 kg	700 kg	-200 kg	750 kg
2	Putri Salju	300 kg	450 kg	-150 kg	420 kg
3	Kastengel	250 kg	350 kg	-100 kg	325 kg
4	Savoury Snacks	800 kg	Stable	0	880 kg

Source: Researcher's analysis (2025)

Table 1 illustrates the production capacity conditions of Shafa Aneka Snack compared with the actual demand observed in the field. Based on these data, several types of cookies experienced production shortages because demand exceeded the planned capacity, particularly for products such as *nastar*, *putri salju*, and *kastengel*. This indicates that the capacity planning implemented in the previous year had not fully anticipated the surge in demand. Therefore, the

company plans to increase its production capacity in the following year. Meanwhile, for savoury snack products with relatively stable demand, capacity adjustments are planned to be more moderate.

Table 2. Production Capacity and Actual Demand

No.	Aspect	Strategy	Impact
1	Planning	Three-year demand chart	More accurate projections
2	Human Resources & Overtime	Additional working hours	Increased production output
3	Raw Materials	Pre-order of scarce materials	Stable stock during peak periods
4	Machinery	Machine optimisation	Cost efficiency
5	Self-service Area	Additional staff	Faster customer turnover
6	Quality Control	Supervisors for each production line	More consistent product quality

Source: Researcher’s analysis (2025)

Table 2 explains the production capacity management strategies implemented by Shafa Aneka Snack to address surges in demand. The company uses demand data from the past several years as the basis for planning in order to produce more accurate production estimates. In addition, extending working hours through overtime is implemented to increase production output, supported by a raw material pre-order system to ensure stable availability. The optimisation of production machinery, the addition of employees in the self-service area, and quality supervision through supervisors at each production line are also important measures to maintain operational efficiency and product quality consistency.

Table 3. Post-Overload Evaluation and Improvements

No.	Evaluation Source	Problem	Solution	Impact
1	Customers	Untidy packaging	Standardised quality control	Improved product quality
2	Human Resources	Worker fatigue	Job rotation and rest periods	Reduced human error
3	Production	Inaccurate forecasting	Updated capacity chart	More accurate planning
4	Warehouse	Declining stock levels	Early pre-order system	Stable supply
5	Self-service Area	Long queues	Additional staff	Faster service

Source: Researcher’s analysis (2025)

Table 3 presents the evaluation results conducted after the occurrence of production and operational overload at Shafa Aneka Snack. The evaluation indicates several constraints, including untidy packaging quality, worker fatigue, and inaccuracies in predicting production capacity. To address these issues, the company implemented standardised quality control procedures, job rotation and regulated rest periods, as well as updates to the production capacity chart. In addition, the earlier implementation of raw material pre-orders and the addition of staff in the self-service area were carried out to improve operational efficiency and service quality in the following periods.

Discussion

Business Characteristics and Seasonal Demand Patterns

Shafa Aneka Snack is a wholesale snack food business that serves customers in large quantities and experiences demand patterns that are highly influenced by seasonal cycles. Demand tends to remain stable on regular days but increases significantly prior to Ramadan, Eid al-Fitr, Christmas, and New Year. This condition creates the need for flexible operational planning, as production capacity must be able to adapt to changes in demand over time. In the context of capacity management, businesses of this nature require a responsive and projection-based planning approach so that companies can anticipate demand surges more accurately. This characteristic also indicates that external factors such as religious events and consumer consumption habits strongly influence the operational rhythm of the company throughout the year.

Production Capacity Gap and the Challenge of Overload

The results of the study indicate that the previously planned production capacity has not been fully able to meet actual demand, particularly for cookie products that become seasonal favourites. The production shortages observed in several products reflect the presence of a capacity shortfall, namely a mismatch between planned output and market demand. This condition suggests that the company's capacity planning still faces challenges in accurately predicting demand surges. To address this issue, the company adjusted its capacity gradually in the following year by increasing production volume based on previous demand data. This strategy allows the company to minimise the risk of stock shortages while avoiding potential losses resulting from overproduction.

Operational Capacity Adjustment Strategies

The company implements several operational strategies to adjust production capacity when facing increased demand pressure. Extending working hours becomes the primary approach because it can quickly increase output without requiring the addition of permanent workers. In addition, pre-orders are arranged for certain critical raw materials to ensure their availability during intensive production periods. The optimisation of machine utilisation is also carried out as an alternative to adding new machines, which generally requires a longer procurement process. In the service unit, the company recruits seasonal staff to accelerate customer transaction flows. Overall, these strategies reflect the application of operational flexibility and the company's adaptive capability in responding to fluctuations in demand.

Operational Evaluation and Continuous Improvement

After periods of high demand end, the company conducts a comprehensive evaluation of all operational aspects. This evaluation includes product quality, workforce conditions, the accuracy of capacity projections, and service efficiency in the self-service area. Several issues identified, such as inconsistencies in product quality and worker fatigue, are addressed through procedure standardisation, job rotation, and strengthened internal control. Improvements in forecasting methods are also implemented to enhance the accuracy of planning for the following year. In addition, evaluations of customer experience serve as the basis for improving the service system. This process demonstrates that the company applies the principle of continuous improvement to maintain product quality and strengthen operational resilience in future peak periods.

Integration of Findings with Capacity Management Theory

The overall research findings indicate that the company has implemented several practices consistent with the principles of capacity management theory. The use of historical data for demand projection reflects the application of forecasting-based planning. Adjustments in working hours, the utilisation of seasonal labour, and the optimisation of machinery demonstrate resource flexibility as part of strategies for dealing with fluctuating demand. Furthermore, the continuous evaluation conducted after peak seasons represents an important

component of quality improvement cycles in operations management. Therefore, it can be concluded that the company's capacity management practices are not merely reactive but also proactive and adaptive to market dynamics.

CONCLUSIONS AND ADVICE

Based on the research findings, it can be concluded that capacity management plays an important role in addressing production overload conditions in snack food companies. Demand surges during certain periods require flexible capacity adjustments through workforce management, raw material inventory control, and more effective production scheduling. Appropriate capacity planning strategies, supported by the utilisation of technology and effective supply chain coordination, can help companies maintain a balance between market demand and operational capability. As a result, the risks of production delays, declining product quality, and inefficient operational costs can be minimised. Based on these findings, it is recommended that companies improve the accuracy of demand forecasting, particularly prior to seasonal peak periods. Companies should also consider adopting or upgrading more efficient production technologies, strengthening raw material inventory management systems, and conducting regular evaluations after peak production periods as part of continuous improvement efforts. These measures are expected to help companies address production overload in a more structured, efficient, and sustainable manner in the future.

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