

A Guide to Efficient Replenishment and Reducing “Stock Outs” within the Grocery Industry

AUSTRALASIA

ECR Australasia – Working Together for Total Customer Satisfaction

Efficient Consumer Response or ECR is a business concept aimed at delivering superior business results in a competitive environment by reducing costs at all stages throughout the supply chain to achieve efficiency and streamlining of processes. ECR is also aimed at delivering improved range, price, service and convenience to satisfy the needs of the consumer.

ECR Australasia reflects a renewed commitment to take costs out of the grocery supply chain and better satisfy consumer demands through the adoption of world's best practices. In an increasingly global food and grocery industry and retail environment subject to rapid change, the future for Australian and New Zealand suppliers, retailers and wholesalers depends on increased efficiencies, reduced costs and added value for consumers. Influences such as global sourcing, new retail formats and channels, international retailers, competing products and services, technological innovation and the spread of e-commerce have all contributed to the pressure for change.

ECR Australasia is an initiative of manufacturers and retailers with the Australian and New Zealand food and grocery industry and its national associations, Australian Food and Grocery Council, Australian Retailers Association, National Association of Retail Grocers of Australia, New Zealand Grocery Marketers' Association, and New Zealand Retail and Wholesale Merchants Association. Launched in November 1999 and directed by a Board of nine industry chief executives, ECR Australasia seeks to build on earlier collaborative work in the industry in Australia and New Zealand and to access the outcomes of ECR related activities in more than 40 countries and globally through the Global Commerce Initiative. As elsewhere, the ambitious work program set by ECR Australasia is undertaken by project teams drawn from manufacturers and retailers with valuable support from consultants committed to the food and grocery industry.

The potential benefits for trading partners are substantial. In a landmark 1999 study for the Australian Food and Grocery Council, PricewaterhouseCoopers identified possible cost savings in excess of \$A1 billion and inventory savings of \$A750 million.

The ECR Australasia Board recognised that efficient replenishment is an area of substantial savings to trading partners and benefits to consumers by reducing costs and "stock outs". The efficiency of supply chain replenishment influences the degree to which we can improve product availability. The Board also recognised that trading partner collaboration will likely be a key driver in the reduction in stock outs.

A Guide To Efficient Replenishment and Reducing "Stock Outs" Within The Grocery Industry is intended as an operational guide which is applicable across a variety of trading environments and provides an improvement path for companies with varying levels of experience and capability. The concepts in this guide reflect the conclusions of studies in Australasia and the USA which were accessed in the preparation of the report.

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The timely completion of the guide is also due in large part to the valuable contributions by the consultants from PricewaterhouseCoopers, which has a long standing commitment to, and reputation for, progressing improvements in the food and grocery industry.

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About this guide

This guide has been developed by a team of consumer packaged goods (CPG) manufacturers and grocery retailers brought together by Efficient Consumer Response Australasia (ECRA). The ECRA Board commissioned this report in response to the growing desire to address the issue of “stock-outs” in the Australasian grocery industry.

There are an average of 5–10% of items out of stock on the grocery retail shelf at any time in the Australasian grocery industry, with higher levels for fast moving products and during peak periods of consumer demand. This is the consistent conclusion of a number of studies in Australasia¹ and several Coca-Cola Retailing Research Institute studies in the USA².

These surveys³ show the impacts of stock-outs to be threefold:

- retailers lose an estimated 20–40% of sales of products which are out of stock worth \$500–1,000 million⁴ across Australasia
- manufacturers lose an estimated 30–50% of sales for their products which are out of stock—worth \$450–750 million⁴ across Australasia
- and finally, both manufacturers and retailers can lose end-consumers.

In this guide we present a framework that sets out the fundamental and advanced concepts for replenishment processes, organisational requirements and enabling systems for both retailers and suppliers to reduce stock-outs. We argue that about 80% of the issues that cause products to be out of stock on shelf appear to be in the store, and therefore improved store management processes and systems should drive the largest single benefit. We further argue that the greatest benefit is likely to be achieved through the collaboration of retailers and suppliers to drive efficient replenishment.

¹ Woolworths out-of-stock survey, 2000; Franklins out-of-stock survey, 1998

² Coca Cola Retailing Research Institute studies, 1997, 1998, 1999

³ As surveys are from a largely grocery chain environment, independent grocery retailers might have different weightings for costs and root causes

⁴ Based on market data from AC Nielsen

The key recommendations to the industry that are set out in this guide are:

- ***Measure and analyse stock-outs to determine the root causes.***
Performance measurement and root cause analysis at all stages of the supply chain should be routine and aligned to the goals common to both manufacturers and retailers. The focus should initially be on the store as 80% of the issues that drive stock-outs are located in the store.
- ***Invest in the improvement of store management.***
Store processes, systems and personnel should be managed to ensure that supply chain execution is effective. Manufacturers can help by ensuring products and information are “store friendly”.
- ***Integrate demand and replenishment planning processes.***
Replenishment should be synchronised with demand, not only within the organisation, but also between trading partners. This is the essence of CPFR (collaborative planning, forecasting and replenishment). Organisations should communicate across the functional spectrum to make this happen.
- ***Reduce lead times and increase the frequency of replenishment.***
Perhaps the greatest reduction in stock-outs will come from a reduction in the average replenishment cycle time—particularly for fast moving products. However, before this can happen processes will need to be effectively managed and supported by enabling systems and collaboration between trading partners.
- ***Understand responsibilities at each stage of the supply chain.***
Replenishment responsibilities vary at each stage of the supply chain. Trading partners should learn how their management practices affect replenishment throughout the supply chain. Then, they should work together to close the “collaboration gap”.
- ***Invest in the appropriate enabling technology and improve data integrity.***
Systems should support best practice replenishment practices, and in turn these need to be supported by disciplines that maintain data integrity. Replenishment orders should be automatic based on consumption and defined rules. However, accurate inventory records and demand drivers should be maintained to minimise replenishment errors.
- ***Involve trading partners in collaborative efforts.***
Replenishment strategies should be set collaboratively. Both trading partners should consider the total business cost of stock availability, product substitutability and rate of sale. Other opportunities for collaboration are likely to include store level demand forecasting, merchandising, synchronisation of store replenishments with shelf filling, and in-store data quality.

The objective of this guide is to provide a useful reference point for grocery companies, regardless of their size or sophistication, to begin to improve supply chain replenishment and product availability. As the reader will no doubt conclude, different levels of investment will enable different levels of performance improvement. There are opportunities for improvement requiring little capital investment. However, the greatest benefit will likely come from improvements enabled through capital investments in the infrastructure of the supply chain—processes, people, systems and trading relationships.

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1 The opportunity

Consumer expectations are not being consistently met when products are out of stock on average 5–10% of the time

Introduction

As most people in the Australasian grocery industry will know, Efficient Consumer Response (ECR) is fundamentally about meeting demand with a matched supply. Therefore, the core challenge for manufacturers and retailers implementing ECR concepts is to understand and then deliver on consumer expectations.

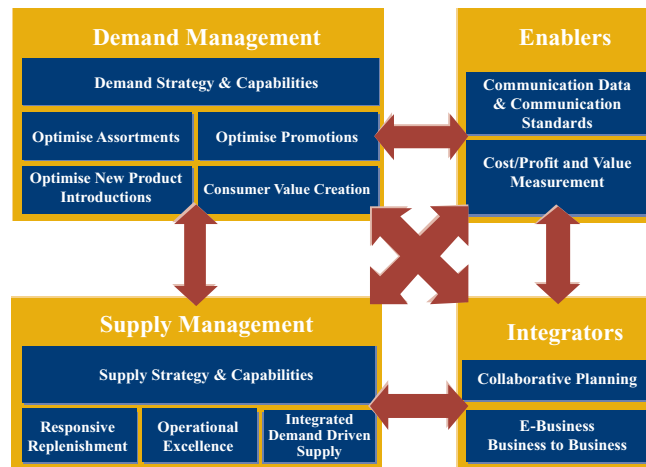


Figure 1.1: ECR concepts included in the Global ECR Scorecard

Consequently, the primary objective of ECR is to have the *right product* in the *right place* at the *right time*. However, products that are out of stock when demanded by the consumer are clear evidence that this objective is not being met consistently. Stock-outs average 5-10% in the grocery industry and can be greater during peak periods of demand and for fast moving products.⁵

A continual stream of new products, frequent promotions and higher customer service expectations, coupled with numerous outdated management practices and antiquated replenishment systems, put a severe load on supply chain processes. When these processes fail and working capital is not available to remedy the failures, the result is a stock-out on the store shelf and ultimately a lost consumer—lost to either the retailer or the manufacturer or both.

The following industry statistics paint the picture:

- Retailers lose an estimated 20–40% of sales of products which are out of stock
- Manufacturers lose an estimated 30–50% of sales for their products which are out of stock
- Half of end consumers report that they would switch retail stores if an alternative store had fewer stock-outs⁶

⁵ Woolworths OOS survey, 2000; Franklins OOS survey, 1998; Coca Cola Retailing Research Institute studies, 1997, 1998, 1999

⁶ Woolworths OOS survey, 2000

- Anecdotal evidence from manufacturers suggests that stock-outs lead to consumers switching brands.

These figures represent hundreds of millions of dollars in the current low growth grocery market (reported at about 2% per annum⁷).

Yet, the industry can respond to these challenges. Improvements in supply chain replenishment practices have been achieved since the introduction of ECR in the mid-90s. Survey results show that leading stores are consistently delivering higher rates of product availability than other stores within the same banner group. Similarly, leading retailers and manufacturers are holding a performance margin in this area over the laggards.

About 80% of stock-outs on shelf are due to issues in the store

Where is the greatest opportunity?

Stock-outs can occur at nearly every point in the supply chain where stocks are held. However, studies completed overseas⁸ and in Australasia⁹ concur that about 80% of stock-outs on shelf are due to “in-store” issues. These include such reasons as:

- product in store (on capping or backroom) but not on shelf
- product has not been ordered
- shelf capacity is not adequate
- store forecasting is inaccurate.

If we analyse issues outside of the store, the remaining issues driving stock-outs are divided roughly evenly between the retailer’s DC or head office and manufacturer’s DC or head office. It should be recognised that these analyses are based on studies which have been completed in a largely grocery *chain* environment. As a result it is possible that the magnitude of issues at various points in the supply chain could vary for independent stores or stores with different formats. Nevertheless, taken together, these results show that the key area to look for solutions to reducing stock-outs is in the store (see Figure 1.2).

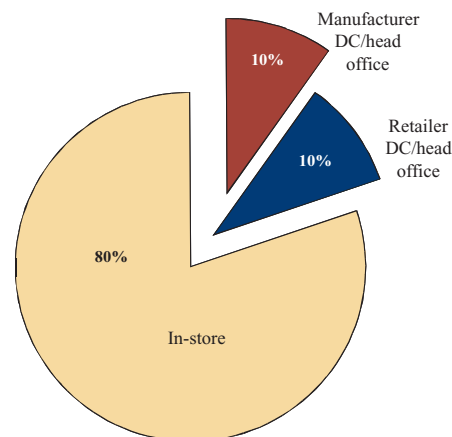


Figure 1.2: Issues driving stock-outs on shelf

⁷ ‘The Australian Grocery Industry in 2005’, a PricewaterhouseCoopers report, 1999

⁸ Coca Cola Retailing Research Institute studies, 1997, 1998, 1999

⁹ Woolworths OOS survey, 2000; Franklins OOS survey, 1998

This does not mean to imply that other parts of the supply chain need do nothing to improve store replenishment processes. For example:

- Manufacturers could improve shelf replenishment by ensuring case sizes are appropriate—ie that they are aligned to shelf replenishment capacities and sales rates
- Retail DCs could deliver product on roll-cages to make store replenishment easier
- Retail head offices could ensure that promotions and product changes are within the store's capacity to execute them
- Retail and manufacturer head offices could ensure that promotions or other demand driving events are planned collaboratively and effectively communicated throughout the supply chain.

The reward is obvious—increased sales and the opportunity to sustain a closer relationship with customers and end-consumers. But, how have the leading companies reduced stock-outs? The answer lies in what we refer to as “efficient replenishment”.

Efficient replenishment provides the highest level of service subject to economic constraints

What is efficient replenishment?

Efficient replenishment is simply the coordination of product movement through the supply chain, ensuring that each stock holding location has sufficient stock at the right time to meet demand at the desired service level.

However, the objective of efficient replenishment is not necessarily to eliminate stock-outs. It should rather be to provide the highest level of service possible subject to economic constraints. The cost of running out of stock should be balanced against the cost of ensuring stock is available.

Figure 1.3 shows the trade-off between the cost of stock availability and the cost of stock-outs. As the service requirement approaches 100%, the cost of stock availability rises exponentially. Experience in the grocery industry suggests that it may not be economic to provide a service level much higher than 99.0% and most certainly not above 99.5% on most products.

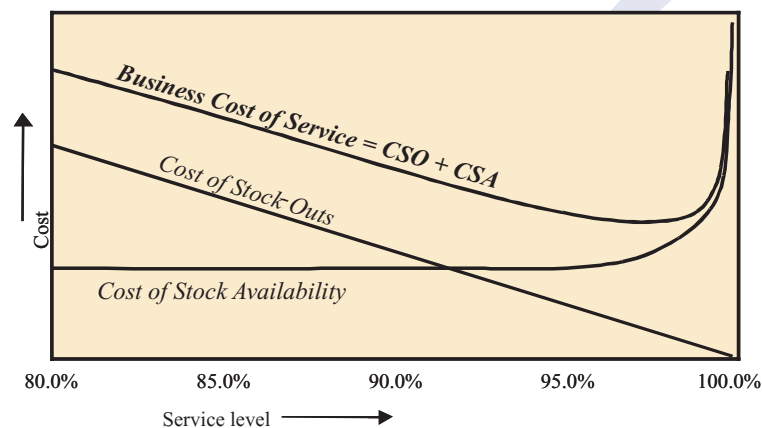


Figure 1.3: Costs of customer service

Service level objectives should be set in order to enable efficient replenishment at all stages of the supply chain considering the cost of stock availability at each location. The costs of stock-outs include most notably the opportunity cost of a lost sale and customer dissatisfaction as described earlier. However, the cost of stock availability can include such things as:

- infrastructure (people or technology) to manage replenishment
- capacity, eg shelves, backroom, trucks, warehouses
- stock handling, eg labour and transportation
- working capital investment in stock holdings.

Experience suggests that the cost of stock availability starts to outweigh the opportunity costs of lost sales when stock-outs are in the range of 0.5–1.0%. Therefore, while we advocate decreasing stock-outs at each stage of the supply chain, we do not advocate eliminating stock-outs. It is clear from Figure 1.3 that the cost of stock availability will grow in line with improved replenishment and consequently lower stock-outs. The key to replenishing efficiently is to replenish at a service level that provides the lowest total business cost.

The guide to efficient replenishment

This guide aims to present
useful steps to enable the
reduction of stock-outs
across the industry

The objective of this guide is to provide a useful reference point for grocery companies, regardless of their size or sophistication, to begin to improve supply chain replenishment and reduce the number of stock-outs to an optimal level. Each industry participant should determine their own lowest business cost of service, and therefore their own optimal level of stock-outs. Mechanisms should then be put in place to routinely monitor performance against these optimums.

The remainder of the guide presents a holistic framework to help companies to take practical first steps and to enable performance improvement across the industry. Whilst all areas of the supply chain are discussed, a greater emphasis has been given to in-store operations, reflecting the level of opportunity in this area.

It should become obvious that different levels of investment will drive different levels of performance improvement. There are opportunities for improvement requiring little capital investment. However, the greatest benefit will likely come from improvements enabled through capital investments in the infrastructure of the supply chain—processes, people, systems and trading relationships.



2 A framework for improving replenishment

Improving supply chain replenishment

Performance improvement requires a holistic approach to implementing change

“Whilst substantially re-engineering supply chains and implementing appropriate IT systems can be important, significant reduction in out-of-stocks can be achieved by adopting the principles of efficient replenishment, along with a clear focus for improvement which is supported by targeted training and straight forward measures of performance.”

Jill Connell

Strategic Planning Director

Franklins Ltd

To make sustainable progress in supply chain replenishment, businesses should implement systemic changes and adopt a holistic approach to performance improvement. Experience has shown that improvement initiatives such as this should consider four dimensions; business processes, organisational capability, information technology and trading relationships. These four areas can be thought of as the “levers of change” (see Figure 2.1) which can be used together to improve replenishment performance.

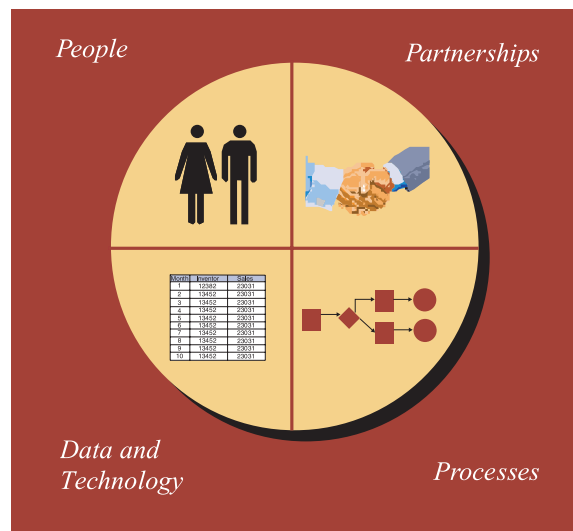


Figure 2.1: The levers of change

Developing any one of these dimensions alone is unlikely to reduce stock-outs significantly. It may even be the case that, for example, investment in advanced business processes which are not adequately supported by advanced information technology could result in increased levels of stock-outs. Therefore, investing in one dimension without corresponding investments in the others can produce diminishing returns.

This guide to efficient replenishment is structured around these four levers of effective replenishment. Each is covered in greater detail in Chapters 3, 4, 5 and 6. Best practices in each dimension have been agreed by the ECRA team and PricewaterhouseCoopers, based on our collective experience and knowledge of developments in Australasia and worldwide.

Replenishment maturity

Collaborative
replenishment planning
and execution enabled
through integrated
systems will provide
the greatest reduction
in stock-outs

As in other areas of supply chain management and ECR, excellence in replenishment requires increasing levels of collaboration between trading partners. Therefore, the greatest reduction in stock-outs will come from collaborative planning and execution enabled through integrated systems and electronic trading networks. However, we argue that benefits can be achieved through further development in all four of the levers of change.

There are three basic levels of maturity. A maturity profile for each of the four levers of change is in Appendix A. In general, these levels can be described as:

- **Fundamental**—on shelf stock-outs are measured on an ad hoc basis and some root causes are identified. Focus areas are known. Replenishment processes are partially documented.
Benchmark: On shelf stock-outs are below 10%.
- **Advanced**—stock-outs are measured throughout the supply chain. Programs are in progress or in place to address identified root causes. Best practice replenishment processes and systems are in place—internally. Collaboration with trading partners is ad hoc and focused on data quality.
Benchmark: On shelf stock-outs are below 5%.
- **Collaborative**—best practice replenishment processes and systems are in place—internally and externally with key trading partners. Collaboration is pervasive, through supply chain processes and across planning time horizons. Mature relationships between key trading partners are based on mutual trust and understanding. Demand, inventory and supply data are routinely shared electronically to provide end-to-end supply chain visibility.
Benchmark: On shelf stock-outs are below 2%.

The benchmarks listed above are based on the collective experience of the ECRA team and PricewaterhouseCoopers. It should be noted that we have not distinguished between products types (eg fresh, dry grocery, general merchandise) or between direct store delivery and central warehouse delivery. The benchmarks should be considered indicative as performance may vary (up or down) depending upon the product and replenishment channel.

It should be noted that best practices in replenishment will not be the same for all products, and all products do not warrant equal management time and focus. Replenishment strategies should be set based on an evaluation of where the greatest returns from limited resources can be achieved. These strategies should be set collaboratively between trading partners and include things such as desired service levels, working capital investments, replenishment practices and performance measures.

Replenishment strategies and product substitution

Replenishment strategies should vary depending upon the substitutability of the product

Not all stock-outs are equally important. Stock-outs for some products may have a disproportionately large impact on overall consumer satisfaction as consumers refuse to accept substitutes. Conversely, stock-outs for other products may have a low impact on overall consumer satisfaction as consumers make little distinction between one product and another. Obviously, the financial impact of substitutions will depend on whether you are a retailer or a manufacturer.

For retailers, if products that have a very *low* degree of substitutability are out of stock, the result is likely to be a lost sale, or at best a deferred sale. In the most extreme cases, consumers may actually leave the store and go to a competitor to make the purchase. In that case, the retailer may lose not only the sale of the product that is out of stock, but also the sales of other products that would have been purchased during the shopping trip.

For manufacturers, if products that have a very *high* degree of substitutability are out of stock, the result is a lost sale as consumers switch to other available products. Depending on the circumstances and category strategies, this could also lead to lower ongoing replenishment orders from the retailer. Either way, the manufacturer loses sales.

Perhaps the greatest impact of either scenario described above is when one of the trading partners does not appreciate the impact on the other and becomes complacent in identifying and addressing the root causes of the stock-out. In this case, the trading relationship is likely to be damaged. Given that collaboration is seen as the greatest opportunity to reduce stock-outs, a damaged trading relationship will be likely to result in greater stock-outs.

This would suggest that targeted service level and replenishment strategy should be specifically agreed, in advance of stock-outs, for products at either end of the substitutability spectrum.

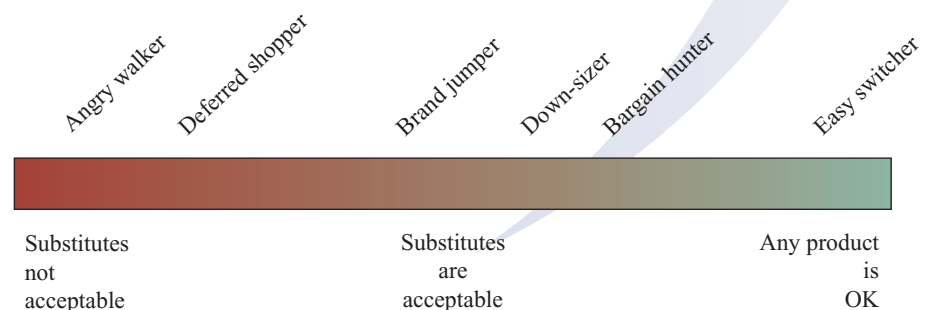


Figure 2.2: The substitutability spectrum

Replenishment strategies and sales rate

Replenishment strategies should also be correlated with the sales rate of the product

Again, not all stock-outs are equally important. Sales rates can also influence the importance of stock-outs. A stock-out only leads to lost sales if a consumer wants to buy the product whilst it is out of stock. A fast moving product may be out of stock for only a short time, but may generate significant lost sales.

There are three groups of products (see Figure 2.3) which may potentially have three different replenishment strategies.

- **Fast movers**—as noted earlier, the rate of stock-outs for these products is greater than 5-10%¹⁰. These products have stock-outs due to the inability of the store to match shelf space and shelf replenishment frequency with the sales rate. Compounding the problem, the high rate of sale generates a higher opportunity cost per minute out of stock. Longer lead times will lengthen the time the product is out of stock.
- **Medium movers**—These products have a lower likelihood of sale rate driving stock-outs, but start to become affected by issues associated with lack of shelf space and planogram compliance. They represent the second greatest area of lost sales, and stock-outs are often more important to the manufacturer than the retailer.
- **Slow movers**—This group is at risk of being out of stock due to the reduced rate of sale and infrequent ordering. However, they represent the lowest group for actual lost sales. Many product lines in this group may sell on average one or less carton (order multiple) per week per store¹¹. Stock-outs occurring in this group remain important for manufacturers, but are often only important for consumers and retailers if the products are not easily substitutable or represent specialty needs.

The existence of these different product groupings suggests that targeted service levels and replenishment strategies should be agreed, in advance of stock-outs, for products depending on the rate of sale.

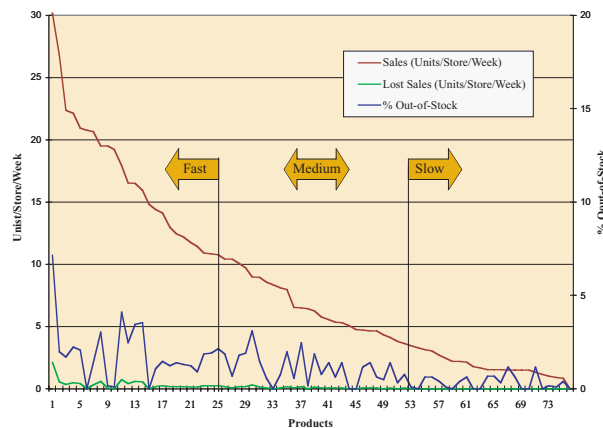


Figure 2.3: Sales, out-of-stocks and lost sales for a sample product category

¹⁰ Woolworths OOS survey, 2000; Franklins OOS survey, 1998; Coca Cola Retailing Research Institute studies, 1997, 1998, 1999

¹¹ Source: AC Nielsen

Managing replenishment

As noted previously, target service levels and replenishment strategies should take into account product substitutability and the rate of sale. For the most important products or categories, replenishment strategies should be developed and executed collaboratively and should involve a greater level of sophistication and management attention. However, who has the responsibility for managing replenishment at each stage of the supply chain?

Industry participants agree that all trading partners (retailers, wholesalers and manufacturers) share responsibility to varying degrees at each stage of the supply chain. Retailers have a greater level of accountability downstream, towards the store, and manufacturers have a greater level of accountability further upstream (ie away from the store). This is discussed more in Chapter 4, but Figure 2.4 conceptually shows the shared accountability for replenishment at each stage of the replenishment process.

Replenishment process	Accountability
To the shelf	Retailer
To the store	
To the retail or wholesale DC	Collaboration Gap
To the manufacturer DC	Manufacturer

Figure 2.4: Replenishment responsibilities

At all stages of the supply chain, there is some sharing of responsibility between trading partners. However, in many cases it appears that the division of responsibilities between retailer and manufacturer is unclear. This may be driven by a lack of understanding and awareness about how actions in one part of the supply chain may impact other parts; it may be aggravated by computer systems which are not sufficiently integrated within or between organisations. This lack of clarity on responsibilities at organisational boundaries we have termed the “collaboration gap”.

The collaboration gap must be closed before significant progress can be made in reducing stock-outs. This may be done through improvements in management personnel (ie training) and through collaborative processes (including best practices and performance monitoring). However, these two alone will not be the answer. Internet linked computer systems are likely to provide the means to close the gap through the sharing of accurate information quickly and efficiently.

Replenishment strategies should be end-to-end, and responsibilities are shared to varying degrees at each stage of the supply chain

General principles

There are general principles of efficient replenishment and performance improvement which should be applied to replenishment processes at each stage of the supply chain.

- Improving replenishment is the responsibility of manufacturers and retailers together. Meeting in-store service targets may entail collaborative working across several replenishment processes.
- In order to reduce stock-outs, one option that yields results quickly is to increase the business' focus on replenishment in general. However, in order to provide *sustainable* solutions to stock-outs, root causes should be identified so that *systemic* changes can be implemented.
- Collaboratively formed replenishment strategies should consider the total business cost of stock availability, product substitutability and rate of sale. Strategies that include both trading partners are likely to drive the greatest total benefit.
- Trading partners should learn how their management practices affect replenishment at all stages of the supply chain. They should then work together to close the collaboration gap and make replenishment efficient. Special focus should be placed on practices that improve in-store replenishment.
- Leadtime and frequency of replenishment can have the greatest affect on replenishment and reducing stock-outs. Practices should be put in place wherever possible to reduce the overall cycle time of replenishment.
- Forecasting is a key component for efficient replenishment—refer to and use the ECRA report “A Guide to Demand Forecasting within the Grocery Industry” (2000).
- Efficient replenishment practices will likely require significant investment in superior systems and software.
- An instinctive reaction to stock-outs may be to increase inventories. However experience seems to point to inventory often being the cause rather than the solution to stock-outs. Excess inventories cause congestion in the supply chain and reduce the degree of synchronisation between different replenishment processes.

The next four chapters of this guide describe in more detail the best practices along the four levers of change—processes, people, technology and trading partnerships.

There are general principles that should be applied to ensure replenishment will be efficient



3

Improving the replenishment process

Replenishment processes should be synchronised throughout the supply chain to end-consumer demand

The store is the final interface with the customer; hence the focus is on supply chain execution

“Customers rate the importance of product availability very highly, and they are unwilling to purchase alternative items when their intended choice is out of stock.”

Guy Arad

Woolworths Ltd

The process dimension

This section of the guide focuses on replenishment processes. Chapters 4, 5 and 6 consider the other three replenishment improvement dimensions—organisation, data and technology and partnerships.

Best practices have been grouped into three areas:

- in-store operations
- DC operations
- head office operations.

In-store operations

In-store operations cover three integrated areas:

- shelf replenishment within the store—the prime objective is to have product on shelf for consumers to buy
- store ordering—the process of generating a store replenishment order. This has been found in several replenishment studies¹² to be the major reason for stock-outs
- execution of planograms and promotions.

Note that in-store data management may also be a key factor in reducing stock-outs. This area is covered in Chapter 5.

In-store operations may cause a stock-out (or a consumer perceived stock-out) if:

- stock-lows are not recognised and acted upon
- shelves are not routinely filled with product
- product on shelf runs out of shelf-life
- replenishment orders are not generated or orders contain errors
- reduced order visibility, due to backorders, results in an order not being placed
- consumers cannot find the product—either due to poor planogram execution or due to promotions being late or unavailable
- capping or backroom congestion causes product to be “lost” or inaccessible.

¹² Coca Cola Retailing Research Institute studies, 1997, 1998, 1999; Woolworths OOS survey, 2000; and Franklins OOS survey, 1998

Seek out and respond to stock-outs and stock-lows

There should be a documented process for checking for stock-outs and stock-lows on shelf, both by physical walking the aisles and by using store based systems.

Physical checks should be made at least once a day, more often for frequently delivered short shelf-life products. At the same time products should be brought forward, labelling checked and damaged products removed from the shelves.

System checks may use stock-on-hand data and sales rate spikes. The former should be reviewed automatically at least once a day. Sharp changes in sales rate for fast moving or promoted products may indicate an actual or potential stock-out. Products at risk could be downloaded into a PDET (portable data entry terminal) to sort products into aisle walking order and even filter products according to consumer impact category. Both stock-on-hand and sales rate spikes should be used to direct physical stock checks.

Options for response to stock-outs are likely to be:

- replenish shelf from capping or backroom
- check that a replenishment order has been placed. If the order is not yet in transit; consider expediting dependent on consumer impact category and local environment
- check that the product is available. If non-availability is temporary, leave the gap open—shelf fillers need to “chase the gaps”. If the product is unavailable long term from the manufacturer, close the window on shelf or put up sign that “product is not available from the manufacturer”

A PDET may be used to advise on which of the above options are appropriate. This may form part of an “on-the-spot” PDET guided stock-out diagnostic (see Appendix E).

Make a shelf filling routine

Shelves should be filled by a set process and timetable, whether by “walking the aisles” or on the night fill process or the day fill process for fast moving products. (In some environments day fill may be preferred due to reduced labour costs). Shelf filling frequency (daily, etc) may depend on the store size and operating environment. 24 hour, 7 day stores are manned during quiet trading times and these staff may be used to fill shelves.

Simplify shelf-life management

For many products the only stock that is in the store should be the shelf stock. This single in-store stock location aids shelf-life management as there is no need to check for different aged stocks on the capping or in the backroom. Stock rotation practices should be documented, eg put newer stock at the back. Shelf-life data from the store stock system may be used to direct a physical aisle check, using a PDET.

Use ASO to generate store orders

Store orders should be generated by an automated store ordering (ASO) system (see Chapter 5 ‘Using data and technology’) and store personnel should have limited scope for changing ASO orders. Manual ordering is prone to errors through:

- replenishment orders not being generated
- inappropriate order quantities caused by inaccurate store forecasts or inaccurate store inventories or miscommunication regarding promotions, new products and deletions
- ordering errors—wrong product details, wrong quantity or wrong delivery date into the ordering system.

Where an automated store ordering system is not in use, store personnel should visually size the order by the number of packs needed to fill the shelf. Manual ordering requires thorough staff training and is aided by strategies which either reduce store ordering complexity, eg EDLP (every day low price) or reduce the impact of missed orders, eg rapid and responsive replenishment.

The more frequently orders are placed, the more opportunities the store has to react to low stocks and avoid stock-outs. However the leadtime for replenishment is the sum of the order placement interval and the order-to-delivery leadtime (see ‘DC operations’); the latter is generally the greater area of opportunity. Also, while administration and transport costs should be taken into account in increasing the order frequency, the critical barrier is likely to be system capability (eg forecasting demand for half a day) and data availability (eg perpetual inventory).

Eliminate backorders

Backorders reduce both the transparency of orders placed and the synchronisation of store replenishment with consumer demand. As real-time demand changes, backorders logged in the system do not. Backorders can lead to:

- surplus stocks—if previous backorders are not taken into account when placing new orders, orders can “pile up” and lead to a late over-delivery
- redundant stocks—if demand is one-off—eg Easter eggs—a late delivery (from a backorder) may be of no use once the demand peak is passed
- added complexity and reduced visibility in the order placement process—stock-outs can be caused because replenishment orders are not placed—because “maybe there is a backorder already in the system”.

Execute planograms and promotions

If planograms are designed appropriately, then using them will help to ensure that there is sufficient product available on shelf, and that consumers can find the product. Consumers will also expect to be able to find promotional items, particularly if they have been advertised. Execution of both planograms and promotions requires effective planning and communication between the store and the head office.

Excess backroom stocks increase double handling and soiled and damaged stock. A Senn Delaney report in the USA found that each case of backroom stock was handled 5 times before being put on shelf, totalling 15 minutes of handling per case.

The keys to reducing stock-outs in the DC environment are speed, responsiveness and accuracy—enabled by systems and driven by a commitment to servicing the retail store

Minimise capping and backroom stocks

If capping must be used, it should be for fast moving, bulky or promoted product only (not for slow or damaged products), in order to:

- reduce double handling
- aid stock rotation
- reduce damages
- reduce stock congestion.

The backroom should be principally an unloading area. Fast moving product may move straight through and onto the sales floor. Some slow moving product may need to be stored in the backroom but stocks should be minimal.

Note that product flow through the backroom implies that store deliveries are synchronised with shelf replenishment and that deliveries are configured to eliminate double handling in the backroom for many products. This is the area of DC operations.

DC operations

DC operations encompass:

- store replenishment—the physical supply of product from the DC to the store
- stock management within the DC, including product receiving, put-away, replenishment, picking, loading and despatch.

This section of the guide covers both retail and manufacturer DCs, as best practices are largely common to both.

DC operations may cause stock-outs if:

- timing of store deliveries are not synchronised with shelf filling. Backroom congestion or late deliveries may delay shelf filling
- outbound product configuration on the truck is not “store-friendly”, ie not compatible with store unloading and shelf replenishment. Additional labour and time required to reconfigure incoming product at the store may leave insufficient resource for shelf filling and stock-out prevention
- promotional stocks are mixed with normal stocks, leading to unexecuted promotions and shelf filling confusion at the store
- order-to-delivery leadtimes are long or too infrequent. If consumer demand increases and the DC takes too long to respond, the store can stock-out
- store replenishment product is delivered late. This could be due to DC congestion or transport delays. The effect is worsened if there is poor communication
- offloading of inbound product is delayed due to DC congestion, causing a stock-out in the DC

- the DC replenishment method is not optimal. For example, if short shelf-life product stocks in the DC are too high, products on the store shelf are more likely to run out of shelf-life.

Manage outbound deliveries to suit store operations

Pushing the timing and configuration of replenishments to meet store requirements may increase transport and DC costs, but these may be outweighed by in-store benefits such as:

- reduced double handling—freeing store resources for shelf filling and out-of-stock prevention
- reduced damages—unsaleable stocks can lead to stock-outs
- reduced backroom stocks—which can otherwise lead to backroom congestion and “lost stock”
- reduced offloading delays—caused when the backroom is full or congested. These delays can cause late deliveries to other stores, which then lead to stock-outs.

Sources of supply should be capable of shipping 24 hours, 7 days to the store where necessary. DCs should consider use of roll-cages, single aisle pallets, etc to aid flow of stock into the store. Where products are moving in large volumes (or for themed in-store promotions) product may be configured at the manufacturer to allow it to be unloaded and taken directly onto the store sales floor. This should only be considered where *total* supply chain costs can be reduced.

Keep promotional stocks separate

Best practice is to separate promotional stocks in planning, replenishment, fulfilment, and physically at the store. This enables greater control of promotion stock levels (including pre-builds) without impacting on regular sales and stock levels. Where promotional stocks have different physical configurations, they should have specific labelling (including barcodes).

Reduce replenishment leadtimes, increase delivery frequency

The cycle time from when a store replenishment order is placed on the DC, through product delivery to store, to shelf replenishment is the key measure of supply chain responsiveness. This in turn is likely to lead to improved product availability on shelf, as when stock-lows are found, stocks can be quickly replenished before a stock-out occurs. (A PricewaterhouseCoopers inventory model shows a 50% reduction in order to delivery leadtime should increase a service level of 90% to around 94%, other things being equal).

Reductions in leadtime can be achieved both by reducing individual process times and by eliminating elapsed time between processes, both at the store and at the DC (see Figure 3.1).

Tesco (UK) have introduced ‘one touch stock’ for fast moving products such as Coca-Cola. Product is packed onto roll-cages at production. These roll-cages arrive at the store and are rolled straight onto the sales floor.

Major grocery retailers in Australasia are already achieving 8–12 hour turnarounds on a regular basis in metropolitan areas and are targeting to reduce this further.

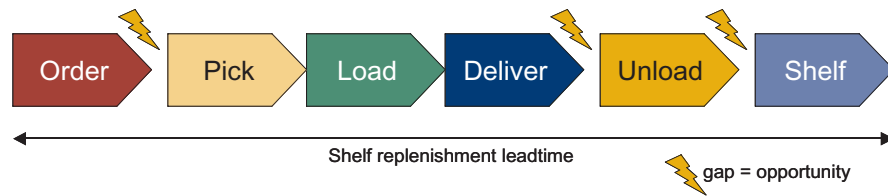


Figure 3.1: Sample replenishment process showing opportunities to reduce leadtime

Note that errors in the process will extend the replenishment leadtime. Examples of ways that the DC can use systems to reduce replenishment leadtimes and reduce errors are given in Chapter 5, 'Using data and technology'. Once leadtimes are reduced, it may then be economic to increase the replenishment frequency to store. This is a critical step towards improved product availability for fresh and fast moving products.

Ensure rigorous quality assurance (QA)

QA failures in the DC, such as shipping out-of-date product, are likely to result in replenishment failures at the store. The QA function should ensure that manufacturer batch codes, product quality, inventory accuracy, etc are maintained. QA processes should be documented, communicated through training and audited to ensure that QA is effective.

Communicate late deliveries

All deliveries to or from the DC should be scheduled to defined time windows. Late inbound deliveries should be communicated by the truck driver to DC goods inwards and may not always be accepted. DC stock-out data should be available to the DC goods inwards, since exceptions may be made to accept late deliveries in order to remove a DC stock-out. Late outbound deliveries should be communicated to the store so that labour can be rescheduled.

Pre-plan DC operations

DC operations should be carefully planned to accommodate operating constraints as well as demand profiles and order leadtimes. Planning systems may be appropriate—see Chapter 5 'Using data and technology'. DC operations can become congested as a result of ineffective and uncoordinated shift planning, uncoordinated labour and machinery planning or poor demand and volume throughput planning.

Leading global retailers (eg Tesco and Sainsbury in the UK) have been using flow-through warehousing for several years. Several Australasian retailers are now trialling this approach.

Select the optimal replenishment method

The replenishment method is likely to impact the order to delivery cycle time and for short shelf-life products, the shorter the dwell time in the DC, the longer the shelf-life available in store. Different DC replenishment options may include:

- Direct store delivery (DSD)—product availability levels may be higher due to manufacturer merchandising, but small deliveries may cause congestion at the store backdoor
- Flow-through warehousing is best practice for fast moving and short shelf-life products, as it minimises product dwell-time in the DC. Store orders are aggregated to DC level to make DC replenishment orders. Product is delivered and reverse picked to zero, by store—automatic case sortation equipment can be applicable. Loads are then despatched to stores
- Cross docking—at pallet level this may be appropriate for smaller manufacturers and retailers that need effective load consolidation from the points of the supply to the store. Pallets are unloaded into a marshalling area for immediate transfer to outgoing trucks.

The replenishment method may be implemented at the DC, but strategic planning for replenishment is generally a head office function.

Head office operations

Head office (retailer and manufacturer) activities include:

- replenishment planning
- store merchandising—planning store ranging and layout to ensure that the on-shelf stocks in the store reflect an appropriate balance between profit, volume, sales rate and replenishment capabilities
- management of product availability

Although head office activities are unlikely to cause stock-outs directly, they can contribute to short term issues and so cause stock-outs (or consumer perceived stock-outs) indirectly, such as if:

- shelf space allocated to a product is not sufficient to hold enough stock to last between successive shelf replenishments
- ranging complexity in a sub-category (especially with many similar manufacturer labels) confuses consumers
- in-store service levels have not been set and resourced—and hence are not being achieved
- replenishment planning has been ineffective, resulting in an overload of supply chain issues in the short term.

The head office plans for replenishment, setting parameters which define the balance between product availability and supply chain cost

Modify planograms to fit individual stores

Planograms should be tuned to individual stores, within an overall layout set for similar stores. If planograms are not sufficiently tailored to store specific micro-markets, stock-outs may become a systemic part of the replenishment process.

Keep planograms up to date

Planograms should be updated in line with category reviews (which should be synchronised, where relevant, with summer/winter or in-season/out-of-season layouts). Design of planograms should be driven by sales volume, profitability, targeted service level and the sales variability of the product. Standard planograms should not be impacted by promotional displays.

Manage assortment complexity

Best practice uses multi-functional software to integrate financial planning, merchandising and space planning into a single process. This ensures that the retailer's financial and marketing objectives are both incorporated into each fixture in every store. A detailed coverage of efficient assortment is outside the scope of this guide. Other ECR projects worldwide are addressing this area.

Proactively set in-store consumer service levels

Optimum service levels should be calculated for each product or product group based on a number of factors including substitutability, profitability and sales rate. The key determinant should be consumer impact. (Note that products may move categories due to seasonality or a store's market strategy and/or environment).

Consumer impact categories are described in Figure 3.2. A slow selling product that is not substitutable, such as icing sugar, can cause store switching if the product is out of stock¹³.

Substutability	High	Routine products: Lowest service level - driven by supply economies and product profitability eg brand of bleach	Routine products: Medium service level - consumers substitute eg brand of toilet roll
	Low	Convenience products: Medium/high service level - meet consumer expectations eg icing sugar (product)	Destination products: High service level - due to consumer and sales impact eg brand of nappy
		Low	High
		Purchase frequency	

Figure 3.2: Consumer impact categories

¹³ Source: Procter & Gamble 'European Shelf Availability Task Force'

Three different levels of service (A, B, and C) should be sufficient for most grocery retailers. Global best practice service levels are 99.0% for fast movers and around 98.0% for slower sellers¹⁴.

In order to achieve targeted service levels, safety stocks should be calculated for each product or product group, based on:

- the desired service level
- the forecast error
- the replenishment leadtime.

Higher service levels, larger forecast errors and longer replenishment leadtimes will increase safety stock—other things being equal. Setting safety stocks is an integral part of the process of setting planograms. For slow moving products the minimum presentation level may remove the need for explicit safety stocks.

Plan ahead for replenishment

In order for replenishment activities in the short term (supply chain execution) to be efficient, longer term planning must be effective. Replenishment planning processes should be documented and integrated across different business functions both within organisations and between key trading partners. Key communication points should be recognised and formalised. Planning at all levels should take account of the relevant supply chain capabilities to ensure that plans are realistic.

The objective of replenishment planning should be to prevent or manage issues before they impact on product availability in the store. This is likely to require a collaborative effort from both the manufacturer and the retailer—this is covered in Chapter 6 ‘Building collaborative partnerships’. Replenishment planning time horizons are in Appendix B.

Communicate stock availability

Confirmation of receipt of an order should be taken as confirmation of stock availability. A collaborative approach should provide full information visibility between supply chain partners—see Chapter 6 ‘Building collaborative partnerships’.

Non-availability of stock from the DC should be communicated to the customer (either the retail head office or the store) as soon as possible. Notification should include the products affected and the expected duration of the out-of-stock. This may result in a surge of “rush orders”, so manufacturers should be prepared for allocation of limited remaining stock.

¹⁴ Source—Wal*Mart

Once the retail head office and the store know the anticipated period of non-availability:

- forecast and planning personnel can treat sales data for an out-of-stock item for this period as exceptional
- store ordering personnel can stop orders for this period of time
- store ordering personnel can ensure alternative products are well stocked to account for product/brand switching
- for long term unsupplied products only, the store may take action to minimise consumer dissatisfaction by re-allocating empty shelf space to reduce the negative visual impact.

Managing the supply chain response to stock non-availability requires appropriate organisational structures and an understanding of retailer and manufacturer responsibilities for replenishment. These areas are covered in the next chapter.



4 Developing organisational capability

Organisation structure and culture should be aligned with business strategies to form high performance supply chains

The organisational dimension

This section focuses on replenishment and the organisation—how organisational structure, reward mechanisms, roles and responsibilities, training and culture can reduce stock-outs. Chapter 3 looked at processes; Chapters 5 and 6 consider the other two improvement dimensions of systems and infrastructure.

Best practices are presented in the following organisational areas:

- defining and managing responsibilities for replenishment
- organisation for store ordering
- store management
- DC management.

The chapter concludes with a summary of the culture changes that may be necessary for both retailers and manufacturers to transform into a high performance supply chain.

Defining and managing responsibilities for replenishment

Recognising and aligning retailer and manufacturer responsibilities is key to efficient replenishment

Because replenishment is a process that goes right through the supply chain, traversing manufacturing and retailing, there are many opportunities for confusion as to the roles and responsibilities of the different supply chain trading partners.

Figure 4.1 shows how retailers and manufacturers share accountability for replenishment. In addition there are shared responsibilities in category management—such as setting category plans and agreeing product range and assortment. Each trading partner's precise responsibilities may vary in different situations; however a fundamental principle is clear. Responsibilities at a trading partner and at an individual level need to be defined and managed. In such a complex environment stock-outs are likely to occur if there is insufficient or inappropriate clarity on ways of working. Retailers and manufacturers alike should define and manage responsibilities to achieve sustainable performance improvements.

Replenishment process	Accountability	Retailer responsibilities	Manufacturer responsibilities
To the shelf		<ul style="list-style-type: none"> • back room management • maintaining planograms • shelf replenishment frequency • filling shelves and bringing stock forward on shelf • shelf monitoring efficient assortment 	<ul style="list-style-type: none"> • Store-friendly packaging • compact products • easy to read and consistent labelling • appropriate pack sizes • shelf management (where appropriate) • efficient assortment
To the store		<ul style="list-style-type: none"> • Placing replenishment orders • order to delivery leadtime • store replenishment frequency • replenishment configuration 	<ul style="list-style-type: none"> • As retailer for DSD only
To the retail or wholesale DC		<ul style="list-style-type: none"> • Procurement planning • demand planning • placing replenishment orders • DC stock management 	<ul style="list-style-type: none"> • On-time in-full delivery • VMI/CMI to DC • collaborative forecasting • 24x7 deliveries
To the manufacturer DC		<ul style="list-style-type: none"> • Order management • demand communication 	<ul style="list-style-type: none"> • Supply planning • demand planning • DC stock management

Figure 4.1: Retailer and manufacturer responsibilities

In order to sufficiently define responsibilities, it would be necessary to map detail responsibilities for a particular area onto roles in that area. Note that responsibilities would be allocated to roles, rather than jobs (areas of responsibility for one person). In different environments, one job may cover more than one role, or conversely, one role may be covered by two jobs.

Define store merchandising responsibilities

Responsibilities of the retailer and manufacturer may vary, but should be agreed to ensure all areas are covered and there are no “un-merchandised” gaps where stock-outs can occur.

Best practice is a collaborative approach beginning with the planning and ranging process (including setting planograms) and the execution of merchandising plans. This should ensure that both manufacturer and store KPIs are being set and measured in alignment with each other. Generally the retail head office sets planograms, but it may be practical to give some limited space to store managers to enable them to respond to local markets.

Organisation for store ordering

As a key step in the replenishment process, store ordering is a focus area for achieving efficient replenishment

If store order writing is manual, most orders should be placed by the store. For allocations of new products, store orders are more likely to be generated by the retail head office, as they should have the best view of overall market demand and product supply. With manual ordering, store staff are likely to require more training in order for placement procedures to reduce the risk of order input errors.

If there is an automated store ordering (ASO) system in use, orders may be written either by the store or by the retail head office. Figure 4.2 shows some of the pros and cons of the two options.

Criteria	Store ordering	Head office ordering
Cost of ordering	Higher cost	Fewer people required—more effective usage of trained personnel
Speed of ordering	Slower	Orders can be generated and then reviewed by exception
Control	Lower Control of ordering through KPIs	Parameters (eg ordering of new range, or changed replenishment leadtime) can be set and applied across store clusters
Local knowledge	For particular categories this can be a significant strength of local ordering	Potentially lost
Response to local sales fluctuation	Can be extremely responsive, especially if replenishment leadtimes are short	Responsiveness limited by order review interval and inventory accuracy
Store staff skills required ordering process	Higher skill level to understand	Minimal skills required in order placement
Inventory record accuracy	Vital—key store KPI	Vital key store KPI

Figure 4.2: Pros and cons of head office vs store order writing

Figures 4.3 and 4.4 represent the information flows in centralised and decentralised replenishment environments. As may be seen, there is a risk of information overload if communication channels are not managed effectively.

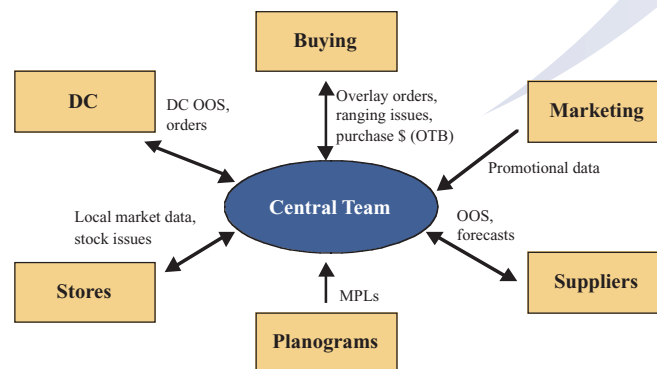


Figure 4.3: Centralised information flow—retail head office writes store orders

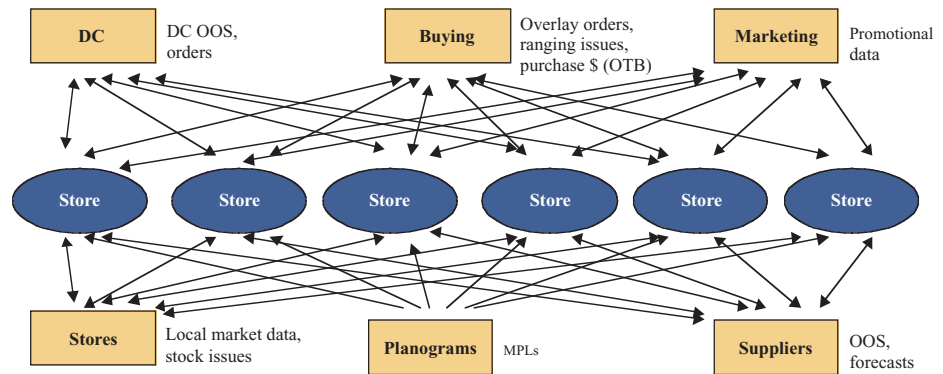


Figure 4.4: Decentralised information flow—retail stores writes store orders

The optimum organisation will depend on the store and head office environment, but may be a mix of the two options: centralised order writing with some top-up orders generated at the store.

Ensure the store order writer has category knowledge

Whether at the head office (Figure 4.3) or at the store (Figure 4.4), the store order writer should have some basic knowledge of the category, so that they can check, at least for high consumer impact products, whether the order is of the right magnitude. This knowledge should include:

- demand drivers—temperature, seasonality, etc
- on week/off week effects for markets where pensions are a major source of income
- substitutability—for what products and in what conditions is the consumer likely to accept substitutes—and if so, to which products consumers switch.

Store management

The best performing stores have a third the stock-outs of the worst

Store management is recognised as a key factor in making store replenishment processes work effectively—however the individual performance of the store manager is unlikely to be the only factor and a focus solely on this role is unlikely to achieve sustained results. The retail grocery store is a complex working environment due to:

- the number and variety of products
- the speed of product throughput
- the need to respond to individual customers
- the constant churn of new products replacing deleted products
- promotional activity
- continual pressure to reduce costs and increase sales.

Labour turnover is high and often inexperienced. In addition, retail margins in grocery are likely to preclude large scale investment in training programs.

However, best practice store management has shown improved product availability, with the best performing stores having a third the stock-outs of the worst¹⁵.

This has been achieved through the consistent application of standard management disciplines, such as:

- ensuring basic stock management principles are adhered to consistently
- mentoring—using experienced staff to ensure knowledge transfer to more junior staff
- empowerment—ensuring that personnel have areas of the operation for which they as individuals or as teams have responsibility (linked to KPIs)
- contingency planning—ensuring that all key personnel have experienced back-ups. This means that back-ups need to regularly “do the job” on a temporary basis to keep their knowledge current
- performance management—setting standards and reviewing performance (KPIs)
- communications with head office and other areas of the business—for example, raising any significant issues with upcoming store-level demand forecasts if they do not reflect local conditions (eg car park being resurfaced).

In best practice environments there are documented guidelines for store management, and store manager performance is audited against defined KPIs. These KPIs are likely to include:

- sales and profitability
- stock accuracy
- in-store stockholding vs target
- stock-outs on shelf
- training provision
- OHS (occupational health & safety)
- hygiene.

Although measures based on sales and profitability may be seen as the most important KPIs, they tend to be lagging indicators—ie they follow from other activities and situations. Measures such as training provision, stock accuracy or planogram compliance may be more likely to be leading indicators of good store management.

¹⁵ Woolworths OOS survey, 2000.

The challenge for
DC management is to
replenish stores more
often with more products

DC management

DC management practices can directly impact on stock-outs at store level, through replenishment speed and responsiveness, inventory inaccuracies, picking errors and in-transit product damage. Leading companies are using a range of initiatives designed to develop a sense of process ownership amongst the DC operations staff and to continuously improve operations through the identification of causes of picking and inventory problems. These initiatives include:

- conducting regular “toolbox” meetings whereby operational staff groups identify problems within the operation, develop solutions and implement them with the support of management
- ensuring operational staff are involved in the process of setting meaningful KPIs and achievable performance standards and targets. KPIs are likely to include:
 - picking accuracy (best practice 99.8%¹⁶)
 - DIFOT (delivered in full and on-time) by case and by order
 - receipt accuracy—percentage of receipts which are correctly identified by SKU, lot and quantity at the time of receipt
- continual training on operating procedures and the correct use of supporting technologies.

A key feature of effective DC management is the optimal use of systems to handle DC operations complexity but still provide the responsiveness that the supply chain requires. These systems, and the data that they rely on, are discussed in the next chapter.

¹⁶ Source: Wal*Mart



5 Using data and technology

Technology is a critical enabler of efficient replenishment because of the degree of complexity in the grocery supply chain and the sheer volume and frequency of replenishment transactions

Data management is the foundation of efficient replenishment in the grocery supply chain

Using data and technology to reduce stock-outs

This section focuses on the information system and data capabilities that, together with the appropriate process disciplines and organisational structures, can enable stock-outs to be reduced.

The key capabilities and technologies that should be developed in order to improve replenishment efficiency include:

- data management disciplines
- merchandising systems
- in-store scanning solutions
- automated store ordering (ASO) systems
- warehouse management systems (WMS)
- transport management systems (TMS)
- advanced planning and scheduling (APS) systems.

Data management disciplines

Data integrity is a prerequisite for all system enabled improvements in supply chain performance, including the reduction of out-of-stocks.

- only if common *data definitions* are in place can replenishment processes be extended effectively across organisational boundaries
- only if *accurate data* is available which reflects demand requirements (forecasts and orders) and supply capabilities (inventory, storage, manufacturing and transport capacities) at each point in the supply chain can systems be relied upon to enable efficient replenishment processes.

Improved data management can also help to identify the causes of stock-outs and hence provide greater clarity on the route to take to reduce them.

Barcoding and data standards

Common data definitions within the grocery industry are principally enabled by the use of barcoding technologies and universal product codes (UPC). UPCs are facilitated in Australasia through industry-wide use of GTINs¹⁷ (global trade item number). EAN Australasia provides and maintains a database of GTIN codes which are accessible to grocery industry members via EANnet.

¹⁷ EAN (European Article Number) and UCC (Universal Code Council) have agreed a common terminology for product codes and now refer to them collectively as GTINs.

Figures 5.1 and 5.2 show the typical applications of the relevant standards:

Old barcode standard	New barcode terminology	Where used
EAN 8	GTIN	Small consumer units (eg small bottles)
EAN 13	GTIN	Consumer units
TUN	GTIN	Traded unit (eg case)
SSCC	SSCC	Logistics unit (eg pallet)
SSCC	SSCC	Shipment

Figure 5.1: Old and new barcode standards and where they are used

Location	Where used	Barcode standard
Store	On shelf	GTIN (retail unit)
	Put-away	SSCC, GTIN
	Receipt	SSCC plus electronic despatch advice
DC	Despatch	SSCC plus electronic despatch advice
	Pick	GTIN (SSCC)
	Replenish	SSCC, GTIN
	Put-away	SSCC, GTIN
	Receipt	SSCC plus electronic despatch advice

Figure 5.2: Location and areas of use for barcode standards

Every movement through the supply chain presents an opportunity for recording error. Every recording error has the potential to generate a stock-out. The use of automated scanning technologies such as barcoding can help to minimise this opportunity for error. Hence barcoding has a key role to play in reducing stock-outs.

Barcodes may also be used for batch control, both at the store level and at the DC level. This may be useful for recall management. Use of barcodes also supports improved shelf-life management, minimising stock-outs caused by unexpected obsolescence.

Perpetual inventory—in-store

Stock-on-hand accuracy is essential as the basis for the generation of any store replenishment orders. Periodical/cyclical stock counts need to be carried out to ensure stock-on-hand accuracy. The emphasis should be on the accuracy rather than the frequency of the counts as quick “approximate” counts tend to introduce errors into the system rather than correct them. Best practice in cyclical counting is to plan the frequency of counts based on product priority, which ensures maximum return from the counting effort.

Scanning solutions are
the front line in gathering
consumer demand data

Merchandising systems

Merchandising and space management applications provide a decision support environment that helps to optimise product ranging and store layout. They contribute towards improving product availability by:

- simplifying the replenishment process by optimising the number of locations where each product is displayed or stored in each retail store
- producing planograms which consider the maximum practical frequency of replenishment when allocating shelf space
- increasing shelf space for each product by rationalising and reducing the product range
- enabling management of markdowns to ensure stock is reduced at the desired rate.

In-store scanning solutions

Two types of scanning solutions may be deployed in-store to enable efficient capture of sales and/or order data at the item level.

Point of sale scanning solution

Point of sale (POS) scanning solutions capture sales data electronically as the sale is transacted at the “register/checkout”. Typically these systems capture item level movement by reading the GTIN barcode via a scanner and accumulating the total daily sales information by quantity and dollar value. This information is typically accumulated and consolidated in the POS “back office system”.

The consolidated sales data or “scan data” can then be used for in-store inventory management and ordering purposes and interfaced to the retailer’s centralised system such as an automated store ordering (ASO) or advanced planning and scheduling (APS) system.

Portable data entry terminals (PDETs)

Typically PDETs are used to read barcodes—from either a barcode shelf label or the physical item and the keypad is used to record information such as the quantity ordered. The primary use of a PDET in-store is for stock reordering, but other applications include:

- stock receiving
- shelf price checking/verification
- item barcode, shelf label or reorder note printing
- stock-take (cyclic or periodic)
- queue busting (ie a portable point of sale).

PDETs can be used in isolation or in conjunction with POS solutions.

Automated store ordering (ASO) systems

ASO systems directly address the known major cause of out-of-stocks: store ordering

The first point at which store information systems *could* be used is to initiate shelf replenishment—however this is not presently feasible as store systems do not distinguish between, say, shelf and backroom inventories. Where store stocks are not all on the shelf, the main trigger for shelf replenishment is likely to remain manual shelf inspections.

Store replenishment (from retail or supplier DCs) can, however, be automated via automated store ordering systems (ASO) which allow regular store replenishment orders to be automatically generated. Human intervention is only necessary by exception or to adjust reordering parameters. ASO systems can reduce human error, order processing time and labour cost.

ASO is effective when:

- stock-on-hand data is accurate and available in a timely manner (eg perpetual inventory)
- POS scan data is available
- accurate demand forecasts and consistent replenishment lead times enable appropriate reorder points to be determined
- manual intervention can be restricted to trained personnel who understand the full impact of manual adjustments made to the system
- reorder points are periodically reviewed to respond to changes in sales volumes and/or replenishment lead times (some ASO systems may include time-phased order point functionality)
- the master file is maintained. This includes product details, minimum order quantities, order multiples, orders for promotional products, discontinued products, etc.

Automated store ordering can be used for all product types. However, depending on the predictability of consumer demand, products or product categories may need to be treated quite differently. Stable, predictable products can have a fixed reorder point and reorder quantity (or maximum stock-on-hand setting), calculated from the historical sales rate and the lead time. Products which have volatile or unpredictable demand (ie high forecast error) should use time-phased order point planning functionality, if available, or re-calculate reorder points frequently.

The need to place a store order can be automatically assessed by the ASO system at frequent intervals (usually daily). This ensures that orders can be generated before stock-outs occur.

Procurement planning systems for DC replenishment

The automated retail DC procurement system may operate from the same merchandising system used to perform ASO or it may operate as a separate system with a link to the store ordering system. The system should be driven by total inventory levels in the retail chain, POS sales data (or aggregated store sales forecasts) and safety stock levels which have been set to achieve a desired customer service level after compensating for forecast error and supply variability during order lead time.

Warehouse systems can handle the complexity of operations, reduce errors and enable integration with store and head office systems

Warehouse management systems (WMS)

Warehouse management systems (WMS) and other technology enablers such as radio frequency (RF) devices, scanning equipment and pick-by-light systems have a proven impact on reducing stock-outs at the DC level. Best of breed systems provide operational stability and drive DC processes, enabling warehouse operations to be responsive and simultaneously maintain the necessary integrity of stock management.

WMS typically provide a number of benefits which can improve product availability, including:

- improved responsiveness through cross-docking and flow through capabilities
- improved stock rotation which reduces obsolete inventory loss and stock-outs at stores
- proactive management of shelf-life through batch control
- labour management and machinery management systems which help to coordinate customer orders, labour and machinery resources to enable efficient fulfilment
- pick path optimisation and the use of labour standards provide higher picking rates which can reduce late deliveries
- support for web-based order status providing customers with a tracking of their orders within the distribution centre thereby providing more visibility of supply and reaction time to deal with stock-outs.

Use of WMS and other technologies can also reduce DC process cycle times and reduce data errors. Best practice is to:

- use advanced shipment notices (ASNs) and EDI for fast and accurate receiving. Using ASNs in the warehouse management system together with radio frequency (RF) receiving makes receipt confirmation fast. This means that incoming stock can be made available for picking more quickly
- use systems for fast and accurate pallet put-away into defined racking locations, based on pre-configured put-away strategies. When this is complemented with RF barcode location scanning, lost pallets in the DC can be practically eliminated
- use systems such as RF, conveyor scanning and sortation equipment, pick-by-lite, pick-by-cart and other technologies to improve picking speed and accuracy. Best practice picking accuracy is 99.8%. The most appropriate technology will depend on the DC environment and customer/store requirements—for example, RF picking is more accurate, but can slow picking rates
- advanced warehouse management systems (WMS) can use volumetrics to plan product into despatch units and then print labels. RF despatch unit confirmation can then ensure that products are loaded onto the correct vehicle and that none are missed off the load completely.

Transport management systems (TMS)

As satellite navigation systems develop, TMS can enable a more consistent transit time to the customer

The use of transport management systems has also been found to have a direct impact on stock-outs, primarily through improvements in store replenishment execution. Best of breed solutions can cover the combined planning and scheduling requirements of both inbound and outbound transportation movements and perform detailed route planning.

Transport management systems can typically deliver a number of benefits in relation to reducing stock-outs, including:

- optimised delivery routes within delivery windows and store access constraints to ensure store replenishments synchronise with store operations
- greater control over flow-through and cross-dock operations such that inbound deliveries are geared towards meeting outbound schedules
- support for coordinated pickups from suppliers for direct delivery to stores to reduce replenishment lead times
- greater management control of transport service providers leading to improved transport service reliability
- support of forward transport planning such that transport capacity is secured to meet expected increases in volumes
- improved utilisation of available transport capacity in order to meet store replenishment requirements.

Advanced planning and scheduling (APS) systems

APS systems allow replenishment planning to be faster and more robust. They can also enable 'what-if' analysis to model and select replenishment options

APS systems are tools to optimise supply chain planning. Typically they provide functionality in the following areas:

- Demand planning
- Supply planning
- Supply scheduling
- Network modelling
- Order management
- Collaborative solutions.

APS demand planning

Demand planning systems include statistical forecasting models and tools for adding market intelligence to the forecast. The use of APS systems for demand forecasting is detailed in the ECRA publication, 'A Guide to Demand Forecasting within the Grocery Industry' (2000).

Demand forecasts, in conjunction with stock-on-hand data, are a vital input to supply chain replenishment processes. Under-forecasting could result in too little stock being ordered and stock-outs; over-forecasting could result in excess stocks, causing congestion in DCs and store backrooms, and markdowns on the store shelves.

APS supply planning

Supply planning functionality enables inventory levels to be modelled and supply chain plans to be created which optimise the use of available resources and manage constraints (DC capacity, production capacity, material availability) to meet forecast medium term demand. Key benefits are:

- rapid planning response times—eg allowing dynamic planning for a significant change in demand
- more robust plans—these can then form the basis for closer tactical planning with trading partners
- improved service levels—reduced stock-outs
- reduced inventories—reduced congestion.

Issues that can be planned and managed proactively in the medium term (such as peak season volumes) reduce the need for more costly reactive measures in the short term, and reduce stock-outs.

APS supply scheduling

Supply scheduling modules are specifically designed to meet the needs of manufacturers in sequencing products through production processes. These impact on stock-outs in two ways. Firstly, they enable production schedules to be more robust—product can be produced as scheduled. Secondly, they make it possible to coordinate production schedules with up-to-date demand data, so that if, for example, there is sudden increase in demand for a product, schedules can respond within the limits of physical constraints.

APS network modelling

Network modelling enables the location and capacity of supply chain resources to be planned to match supply chain capabilities to market demands over the longer term. Typical applications include warehouse sizing and location, supply from DCs to stores and production sourcing options for manufacturers.

APS order management

Real time available-to-promise and capable-to-promise calculations enable realistic commitments to be made against inventory or production capacity which can improve the reliability of promised order dates from manufacturer to retailer.

APS collaboration

Collaboration solutions enable forecasts and supply chain plans to be shared with trading partners. Partners may share data, compare independently prepared plans or collaboratively produce one replenishment plan. Exceptions in the plans are resolved interactively in response to automatic alerts sent over the internet. APS functionality is increasingly being deployed collaboratively, either in a B2B or e-Market model.



6 Building collaborative partnerships

Collaboration is the largest untapped opportunity to achieve efficient replenishment

Building collaborative partnerships

This is the present challenge for ECRA members. Studies around the world have shown that successful collaboration can both improve product availability throughout the supply chain and reduce costs. In Australasia collaboration is particularly important due to the need to minimise distribution costs and to manage long leadtimes for imported products or imported materials.

However the organisational, cultural, procedural and technological barriers to effective collaboration are significant. This chapter examines the principles that have, in the experience of ECR Australasia, been the basis for effective collaboration. We then go on to look at the development path for collaboration in the grocery industry. Finally we present some of the opportunities and best practices to reduce out of stocks through collaboration.

Principles of successful collaboration

Successful collaborative relationships can be formed between parties that have mastered the principles of collaboration, the 4Cs, which are set out in Figure 6.1.

There are four principles

of collaboration:

- compatibility
- commitment
- capability
- control

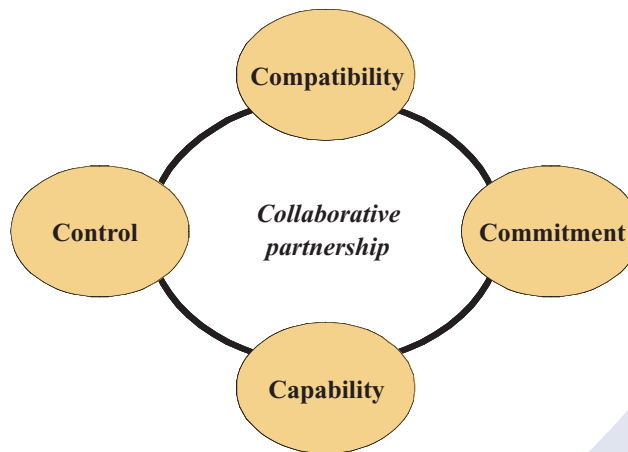


Figure 6.1: The 4Cs of collaboration

Compatibility—trading partners should have similar goals and desires that are mutually important to the relationship. Compatibility is enhanced if corporate cultures can be aligned, integrated business processes can be developed and common data standards are adopted.

Commitment—trading partners must want to collaborate for the common good, with clear sponsorship at the most senior levels within each organisation. It may be necessary to stop practices that distort demand and conflict with collaboration objectives. For example, the practices of pushing product into the trade in order to meet short-term budget requirements and unplanned investment buying may no longer be acceptable.

Capability—trading partners must be capable of sharing usable and accurate information. Many collaborative initiatives have started out with a pilot site or selection of products so that each party can develop their capabilities at minimum risk. It is counter-productive to commit to collaborative processes that are not supported by the capability of internal systems and processes.

Control—trading partners should have agreed the mechanism and policies for collaboration, including the thresholds for identifying exceptions, and how the information should be used. Each partner should commit to creating an environment of trust in which competitively sensitive information can be shared in confidence. Performance metrics should be agreed early and frequently reviewed.

Kimberly-Clark and Kmart

have formally reported on their CPFR pilot, which covered replenishment of 16 products across 14 distribution centres and 2100 stores. By adopting collaborative replenishment processes, in-stock performance was improved from 86.5% to 93.4%—which enabled a 14% increase in sales with no change in inventory turns.

The key cultural change was a shift of focus away from DC service levels to store service levels. The closer working relationship has also resulted in improved coordination of product roll-overs, shelf set changes and new product introductions.

source—VICS 'Roadmap to CPFR: The Case studies' 1999

Developing collaborative relationships

The degree of collaboration that is appropriate in a trading relationship is dependent on the mutual attractiveness of the trading relationship (volume, profit and volatility are drivers) and the level of the internal capability of each trading partner. When determining a strategy for collaboration, both parties should consider the stepping stones towards full collaboration maturity, which are set out in Figure 6.2.

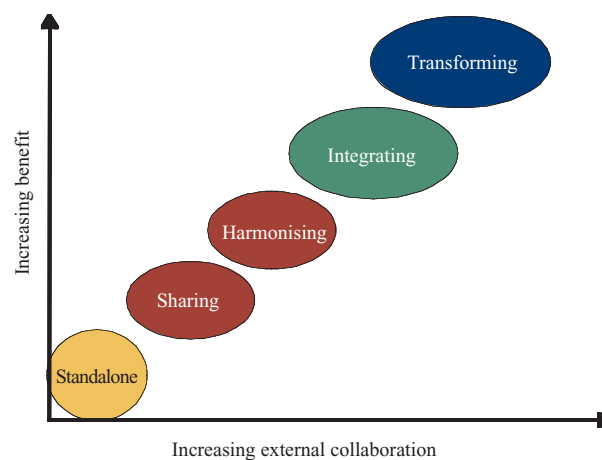


Figure 6.2: Collaborative capabilities—a maturity path

Procter & Gamble has adopted collaborative replenishment processes with several of its retailers world wide. CPFR pilots with **Tesco, Target, Sainsbury, Wal*Mart** and **Meijer** were specifically targeted at reducing out of stocks at the retail store.

The collaborative vision was to sell more product to the consumer by concentrating on delivering product reliably and efficiently to the retail shelf using POS data.

By mapping the detailed replenishment processes at both vendor and retailer P&G was able to reduce its on-shelf replenishment cycle between 12 and 20%.

source—VICS 'Roadmap to CPFR: The Case studies' 1999

Collaboration provides opportunities to reduce stock-outs through the replenishment process

When trading partners are in “*standalone*” mode, the collaborative focus is on improving the efficiency of transactions. Trading partners at this level of maturity should focus on adopting industry master file standards and building internally integrated supply chain planning processes.

The progression to the “*sharing*” stage involves the exchange of data that is not immediately related to transactions between the parties. Examples include sharing of scan sales, stock levels and out-of-stock performance.

Partners in the “*harmonising*” stage share and compare independently developed forecasts and plans. Exceptions are investigated and compared.

In the “*integrating*” stage partners collaboratively develop one forecast and replenishment plan based on a fully developed business and promotional plan. The plan is maintained interactively, usually over the internet.

“*Transforming*” represents the final stage of maturity when collaborative business practices have evolved to include all qualifying partners and extensive use is made of industry internet exchanges to improve the efficiency of the collaboration process.

Collaboration opportunities

There are opportunities for manufacturers and retailers to reduce stock-outs at each replenishment point in the supply chain by means of closer collaboration in replenishment planning and execution. Figure 6.3 shows a sample of these opportunities.

There are five opportunity areas which recur at almost every stage of the replenishment process. These are key opportunities for trading partners to take practical steps to reduce stock-outs:

- product labelling, eg barcodes
- sharing planning data
- optimising reorder multiples and packaging design
- collaborative replenishment, eg direct store delivery
- performance management.

Note that although *collaborative forecasting* presents a major opportunity for improving replenishment, it is not explored further here as this area has already been covered in a previous ECRA publication, ‘A Guide to Demand Forecasting within the Grocery Industry’ (2000).

Replenishment process	Accountability	Collaboration opportunity
To the shelf		<ul style="list-style-type: none"> • Joint merchandising (planograms) • High quality barcoding • Shelf-ready packaging design • Pack size • Promotion execution • Performance management
To the store		<ul style="list-style-type: none"> • Collaborative forecasting (store level) • DSD delivery planning • DSD delivery configuration • DSD delivery operation (eg 7 day) • DSD delivery timeliness • High quality barcoding • Performance management
To the retail or wholesale DC		<ul style="list-style-type: none"> • Collaborative forecasting (DC level) • CWD delivery planning • CWD delivery configuration • CWD delivery operation (eg 7 day) • CWD delivery timeliness • Cross-docking • Flow-through • High quality barcoding • Promotion planning • Performance management
To the manufacturer DC		<ul style="list-style-type: none"> • Collaborative forecasting (DC level) • High quality barcoding • Promotion planning • Service level monitoring • Performance management

Figure 6.3: Sample collaboration opportunities in replenishment

Use high quality barcodes and consistent product descriptions

Ensuring that product barcodes, product descriptions (and product pricing) are consistent between manufacturer and retailer, through DC and store is a major step towards reducing stock-outs. Figure 6.4 shows possible impacts through the supply chain of poor quality barcodes and inconsistent product descriptions.

Impact area	Issue	Impact
Store check-out	GTIN on consumer unit fails to scan	<ul style="list-style-type: none"> • High impact • Manual workload • Data entry errors—eg scanning substitute twice • Inventory errors • Orders not placed by ASO • Stock-outs on shelf
Store shelf	Product description on case does not match shelf label	<ul style="list-style-type: none"> • Medium impact • Shelf filler may put product in wrong area on shelf • Customer cannot find the product—customer perceived stock-out
Store back-door	SSCC or GTIN not readable	<ul style="list-style-type: none"> • Medium impact • Limited manual entry of codes and opportunity for data entry error
DC picking	GTIN not readable	<ul style="list-style-type: none"> • High impact • Miss-picking leads to failed store replenishment and stock-out
DC put-away	SSCC not readable	<ul style="list-style-type: none"> • Medium impact • Manual code entry and opportunity for data entry error • Opportunity for lost pallets leading to failed store replenishment and stock-out

Figure 6.4: Impact of poor quality product identification

Improvements in data quality throughout the supply chain are likely to lead to a significant and lasting reduction in stock-outs. Use of quality barcodes is an important milestone on this path and use of EANnet could be a practical starting point.

Share planning data

Best practice in managing promotions, bringing new products to market and deleting old ones is to share appropriate planning data so that retailer and manufacturer can work together to develop, agree and execute the plan. Trials worldwide have shown the positive impacts of collaborative planning on product availability. A full coverage of this subject is beyond the scope of this guide, however the ECRA publication, ‘A Guide to Demand Forecasting in the Grocery Industry’ covers some aspects.

Optimise reorder multiples and packaging designs

Agreeing appropriate reorder multiples and case sizes can avoid the need for the shelf to be empty (ie for the store to be out-of-stock) before there is space to put another case on shelf. Packaging designs should incorporate high quality barcoding and consistent product descriptions. Rip-tab cases and shelf ready packaging can reduce shelf fill times and so reduce stock-outs.

Aligning KPIs between trading partners is an effective way of ensuring that both parties are working to a set of common objectives

Use collaborative replenishment

Direct store delivery (DSD), flow-through warehousing and co-managed inventory (CMI) are all examples of collaborative replenishment. By working together to better utilise demand information and better manage physical stock replenishment, retailers and manufacturers can both improve availability and reduce total supply chain costs. Examples of collaborative replenishment options are given in Chapter 3, 'Improving the replenishment process'. This has been a focus area for many ECR initiatives worldwide and the VICS (voluntary inter-industry commerce standards association) has developed a comprehensive set of standards and processes available via their website (www.cpfr.org).

Align performance management

Performance measures (KPIs) and targets should be used to align trading partners and foster the trust required for effective collaboration. Two specific areas are:

- measuring sales by scan data—this is likely to remove incentives for manufacturer account managers to attempt to push trade sales and increase retailer inventories; it is also likely to lessen incentives for retail buyers to make large investment buys. Inventory pushes can cause DC congestion, which like uncoordinated investment buys can lead to out-of-stocks
- supplier performance monitoring—this should include delivery window reliability, delivery accuracy, product quality, product packaging performance and product presentation. Supplier service level agreements and regular service reviews can result in fewer stock-outs due to product unavailability, quality and damage.

Another key KPI which should be used to align retailer and manufacturer is the level of stock-outs. From this, with a common understanding of out of stock root causes, work can begin on stock-out reduction. This is the focus of the next chapter.



7 Getting started

A structured path to efficient replenishment is recommended

To determine your objectives, consider your current position relative to your desired position within the framework for efficient replenishment

“Root cause analysis is a key step of every shelf availability project as it enables the implementation of joint action plans between retailer and supplier as well as a deeper understanding of the total supply chain”

*Procter & Gamble
European Shelf Availability
Task Force*

How to get started

Improving sustainable product availability requires a planned approach to change. The stages of the initiative should include:

- Determine your objectives
- Plan the change
- Organise for the change
- Manage the change.

This chapter concludes with a summary of the significant cultural changes involved in moving to an efficient replenishment supply chain.

Determine your objectives

Determining your objectives involves answering the following questions:

- What is the current level of out-of-stocks? This should be differentiated between different products according to consumer impact category
- What are the root causes of stock-outs? This is a crucial step for collaborative projects. Without a deep understanding of the systemic causes of out-of-stocks, the project is unlikely to be able to focus resources and assign trading partner responsibilities so that a sustained reduction in out of stocks is achieved
- How well are current replenishment processes performing? The framework for efficient replenishment outlined in Chapter 2 and the maturity profiles in Appendix A may be used as a basis for assessing this
- What are the right replenishment strategies? These will depend upon which products are key for out-of-stocks reduction
- How well should the replenishment process be performing for these key products? Again Chapter 2 and Appendix A may help.

The gap between the current state of replenishment performance and the desired state becomes the improvement target for the project. This target should be built into a business case for change that estimates the impact on ROI if product availability can be improved and the project cost of delivering this.

Project objectives should be documented in a project charter, which should include:

- **the supply chain vision**—how supply chain participants should collaborate to enable efficient replenishment
- **the scope of the project**—how this project will contribute towards realising the supply chain vision and the people and systems that will be affected (in the supplier and customer organisations)

- the objectives of the project—why the project is necessary and how its success will be measured (for example, target levels may be set for metrics such as stock availability, inventory turns and forecast accuracy); how benefits will be shared between partnering organisations
- the approach—what the project activities will be and the key milestones that will be used to monitor progress
- the roles and responsibilities—who will be responsible for sponsoring the project; the resources that will be committed to the project and their responsibilities; how the issues such as confidentiality of information will be addressed.

Plan the change

Work backwards from
the deliverables and
milestones to identify
the required tasks

Planning the change involves identifying:

- the deliverables
- the milestones for monitoring project progress
- risks and strategies for minimising them
- the tasks necessary to produce the deliverables
- the resources necessary to produce the deliverables
- responsibilities
- a feasible schedule.

It can be useful to group the tasks to be performed according to a work structure. For example, the stages of implementing improvements to replenishment processes may include:

- **Mobilisation**—including the determination of the vision and business case for the improvement
- **Design**—including the definition of the business requirements, the design of the new ways of working and the selection of appropriate enabling information systems
- **Prototype**—including the identification of appropriate replenishment practices, the configuration of software and the testing of selected business scenarios
- **Pilot**—including the testing of the replenishment practice (system enabled as appropriate) and the ultimate acceptance by the business(es)
- **Roll-out**—including the final implementation of the replenishment practice in a live environment
- **Mastery**—including the reinforcement of the new ways of working and the ongoing tracking of benefits delivery.

It is important that the project be properly sponsored and that a suitably senior member of management play an active role in resolving critical issues

Organise for the change

Organising for the change requires developing a project structure, forming a project team and developing a communication plan and process to ensure that affected parties who are not members of the core team are kept up to date. The project structure may include a steering committee, project managers, key advisors and project team members.

It is important that the project be properly sponsored and that a suitably senior member of management play an active role in the steering committee, which will be called on to resolve critical issues escalated by the project manager and to approve the progress of the project from phase to phase. In collaborative replenishment projects both the supplier and customer should provide senior representatives to the steering committee.

Sub-project teams are usually set up to enable team members to focus on process, application and technical tasks. Depending on how the project stages are scheduled there may be some overlap between the sub-teams; for example, the same team member may be responsible for replenishment process design and system application configuration. Key advisors can provide part-time assistance to the project, advising on matters such as system interfacing and change management.

Manage the change —deliver the benefits

Manage the change

The last step is to manage the change with formal project management techniques monitoring, in particular, benefits realisation and implementation issues. This will mean recognising and managing the cultural changes listed in the next section.

One of the greatest challenges in reducing stock-outs is likely to be cultural change

Culture change

Moving to more efficient replenishment practices is likely to involve a high degree of change to the paradigms which underpin how the organisation (or organisations in the supply chain) behave. Managing these changes effectively is likely to be one of the greatest challenges for the project. Key changes are summarised in Figure 4.5.

<u>From</u>		<u>To</u>
Differing viewpoints	→	Common vision
Functional silos	→	Process based teams
Firefighting	→	Planning
Competition	→	Collaboration
Driven by urgency	→	Driven by business priorities
Reactive communication	→	Proactive communication
Manufacturer focus on sales	→	Manufacturer focus on service
Data accuracy is not important	→	Data accuracy is essential

Figure 4.5: Culture changes involved in efficient replenishment

It is sometimes tempting to think that all that is needed is to “put in the system” and that a technical solution will be sufficient to address the problem. Experience has shown that technically sound projects will fail if not integrated with process and cultural change. The last key change in Figure 4.5 is illustrative; the systems that support efficient replenishment practices themselves rely on accurate, timely and complete data.



**Appendix A:
Efficient replenishment maturity profile**

Maturity profiles

These maturity profiles may be used to gauge the present level of maturity of replenishment. They may also be used to set future goals—the gap will then form the basis of the efficient replenishment project plan (see Chapter 7, ‘Getting started’).

Area	Fundamental	Advanced	Collaborative
Processes	Reactive	Proactive	Integrated
In-store	Manual ordering. Ad hoc shelf filling. Poor planogram compliance.	Automated ordering. Shelf filling schedules. Minimal capping.	As advanced, plus: Store specific planogram compliance is high. Most store stock is on shelf.
DC operations	Store delivery timing unreliable. Picking accuracy > 98%. Store response in < 48 hours.	Store deliveries synchronised to store operations. Picking accuracy > 99%. Store response in < 24 hours.	As advanced, plus: Picking accuracy > 99.5%. Store response in < 8 hours. Capability to handle “overlay orders”—updates to orders actioned shortly before despatch.
Head office operations	Blanket planograms. Blanket service levels or service levels not set.	Planograms fit store group. Managed assortment. Explicit service levels.	As advanced, plus: Planograms fitted to store. Suppliers involved. Efficient assortment. Collaborative replenishment planning.
Area	Fundamental	Advanced	Collaborative
People	Functionally skilled	Cross functional teams	Trading partner teams
Culture	Driven by urgency. Reactive communication. Importance of data not understood.	Internally aligned. Proactive communication. Importance of data integrity recognised.	As advanced, plus: Externally aligned. Proactive communication with trading partners.
Roles & responsibilities	Poorly defined.	Defined and documented.	As advanced, plus: Roles and responsibilities are aligned across trading partners.
Performance management	Implicit.	Explicit. Aligned to cross functional team goals.	As advanced, plus: Aligned to goals of trading partner teams.
Area	Fundamental	Advanced	Collaborative
Data & Technology	Spreadsheets	Cross functional process support	E-business
Data integrity	Poor. Store inventory accuracy < 70%. DC inventory accuracy < 95%. (Measure is +/-5%)	Good. GTIN/SSCC in use. Store inventory accuracy > 70%. DC inventory accuracy < 95%.	As advanced, plus: GTIN/SSCC near complete compliance.
Systems	Multiple systems. Not integrated.	Integrated systems. ASO, APS, WMS, TMS implemented.	As advanced, plus: Systems used to provide inventory and demand transparency across the supply chain.
Area	Fundamental	Advanced	Collaborative
Partnerships	Arms length	Ad hoc	Operational, tactical and strategic
Commitment	Little or no executive support for adopting collaborative trade relationships.	Strong executive support for adopting collaborative trade relationships.	Strong executive support for progressing collaborative trade relationships with both supplier and customer organisations.
Capability	Little or no awareness of collaborative processes.	Widespread understanding of the details and benefits of collaborative replenishment processes.	Pilot collaborative forecasting initiatives are in place and are being rolled out.
Compatibility	Industry coding standards (such as SSCC and GTIN) are not fully implemented.	Industry coding standards (such as SSCC and GTIN) are fully implemented.	Industry coding standards (such as SSCC and GTIN) are fully implemented. KPIs are aligned with major trading partners.
Control	Traditional transaction processes.	Agreed processes and decision limits between trading partners. Performance targets are mutually agreed.	Data security issues are addressed. An environment of trust has been established. Service level agreements are in place and exception reporting mechanisms function effectively.
Retail DC replenishment orders	Orders are initiated by the customer.	Supplier has the capability to suggest order quantities. Orders may be initiated by the customer or the supplier. The supplier has full visibility of orders and the ordering process.	Most orders are initiated based on the short term “frozen” period of a jointly developed replenishment plan. Supplier’s order visibility is made accessible through networked systems.

Figure A.1: Efficient replenishment maturity profiles



Appendix B: Replenishment planning time horizons

Replenishment time horizons

Stock-outs are an immediate issue. However effective replenishment covers a much wider time horizon. Figure B.1 shows the time horizons for different replenishment planning and execution activities.

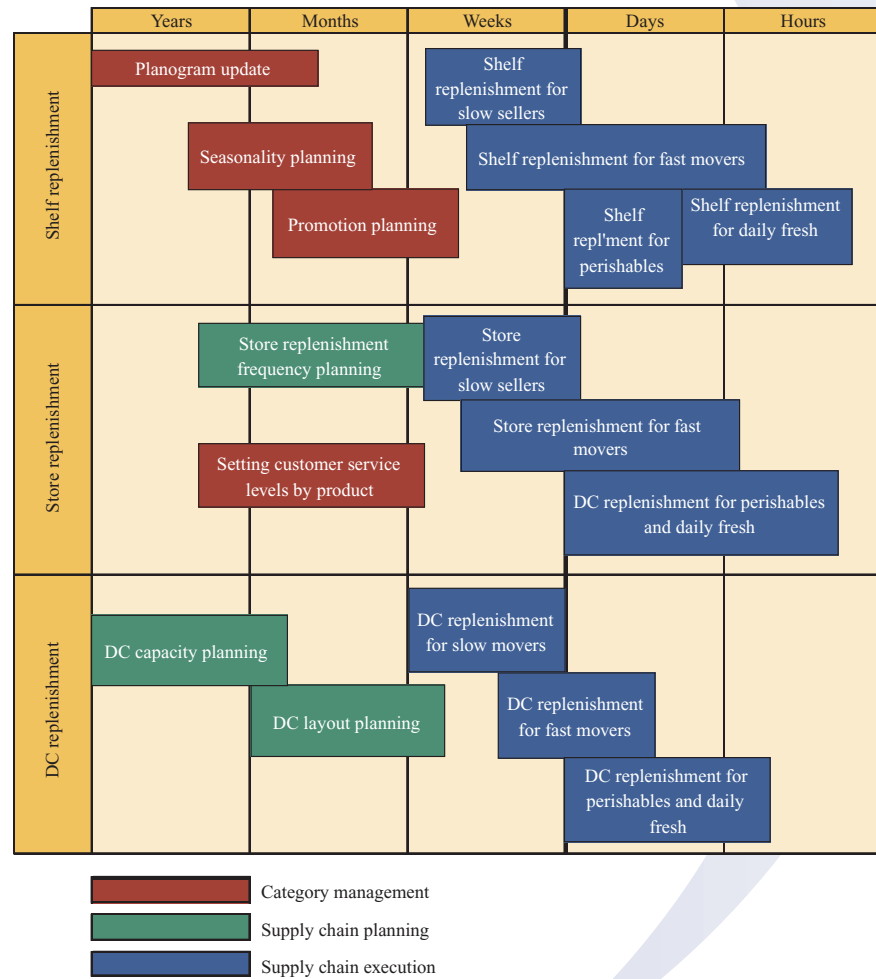


Figure B.1: Time horizons for replenishment planning and execution activities

Failures in longer term processes may create issues in the short term that may exceed the organisation's short term capability to handle in a sustainable process. A linkage should be made between plans at every stage and the ability to execute these plans—ie a link between category planning, supply chain planning and supply chain execution.

The supply chain and the store have capabilities to respond at very short notice. However this capability can be used either to cover the systemic gap between planning and execution, or it can (and should) be used to respond to the dynamic changes in market demand, as shown in Figure B.2.

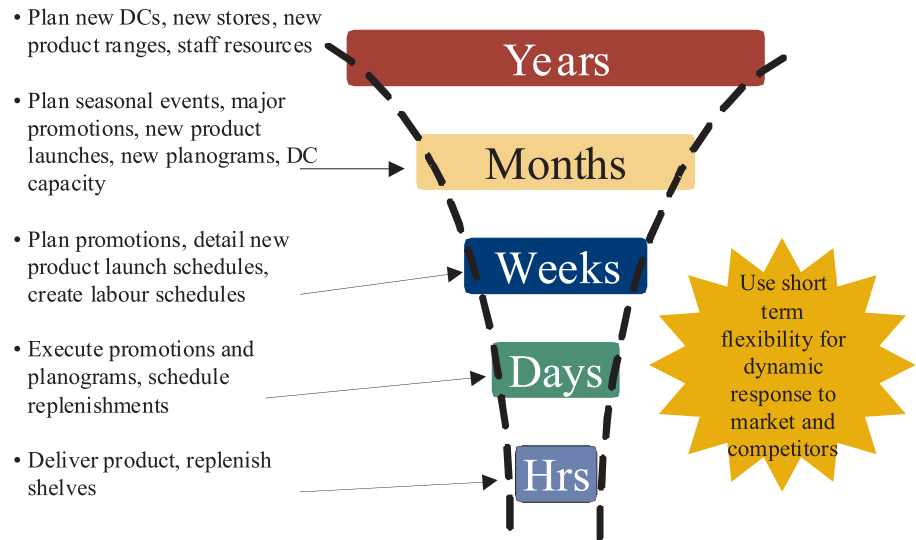


Figure B.2: The replenishment planning “funnel”

This also has implications for collaboration. High levels of collaboration in the operational time horizon may not effectively address strategic and tactical misalignments and miscommunication.



Appendix C:

Case study: Franklins Supermarkets

Case study: Franklins Supermarkets

Background

Franklins is a well-known food and grocery retailer based in Australia and part of the Dairy Farm International retailing group. It has approximately 286 stores and annual turnover of around \$4 billion in Australia.

Around three years ago Franklins decided to conduct an initial study into out of stocks. This initial work led to two other projects, both of which applied learning from the initial study to improve store operations. Over a period of three years, these three projects developed into an advanced on-going process to monitor and address out of stocks. This case study covers the series of three projects that Franklins has conducted and outlines the major findings.

Project 1: Analysis of out-of-stocks

Process

In 1998 a survey was performed on a limited number of stores over two days. Stores were chosen both to represent a cross-section and to allow comparison between individual stores within a store-group. The survey covered the frozen, chilled and ambient sections within each store in order to determine whether particular product groups were more susceptible to out-of-stocks than others.

Results

Out-of-stocks were categorised and attributed to three root cause areas:

- store replenishment process
- supply to stores
- in store stock handling and fixture management.

Store replenishment process was the largest contributor, comprising 58% of all out-of-stocks identified in the survey.

The Franklins grocery store replenishment (ordering) process is automated—taking into account what has been sold and what is in the replenishment pipeline. However manual interventions were known to be causing problems with the system and these were resulting in ordering inaccuracies and wide variations in ordering patterns.

Supply to stores was the second largest contributor at 24% of all out-of-stocks. This was further split up into two discrete causes:

- supplier out-of-stock (16.1%)
- warehouse out-of-stock (7.6%).

The “supplier” cause was broken down again into:

- direct line (9.4%)
- not delivered by supplier (4.1%)
- temporarily unavailable (2.6%).

“Temporarily unavailable” was a situation where the supplier was unable to supply for a period of time, but had notified Franklins in advance. “Direct lines” are direct to store delivery from the supplier (DSD) products.

In store stock handling and fixture management made up 18% of all out-of-stocks and was again broken down into a number of root causes:

- located elsewhere (7.1%), where stock was available in the store (capping, gondola end, etc) but there was a stock-out on the shelf
- new line (5.1%), where the ticket was placed on the fixture but the new product had not yet arrived
- discontinued (5.1%), where the product was no longer ranged but the ticket had not been removed from shelf.

Figure C.1 shows the breakdown of root causes for out-of-stocks. It clearly shows that 80% of out of stocks are associated with the retail store environment and 16% are due to lack of product availability from the supplier. It is important to note that the identification of the in-store root cause does not imply that the issue is simply a retailer responsibility. Collaboration between suppliers and retailers in improving the replenishment process is likely to be key to making a significant and sustained impact on the in-store environment.

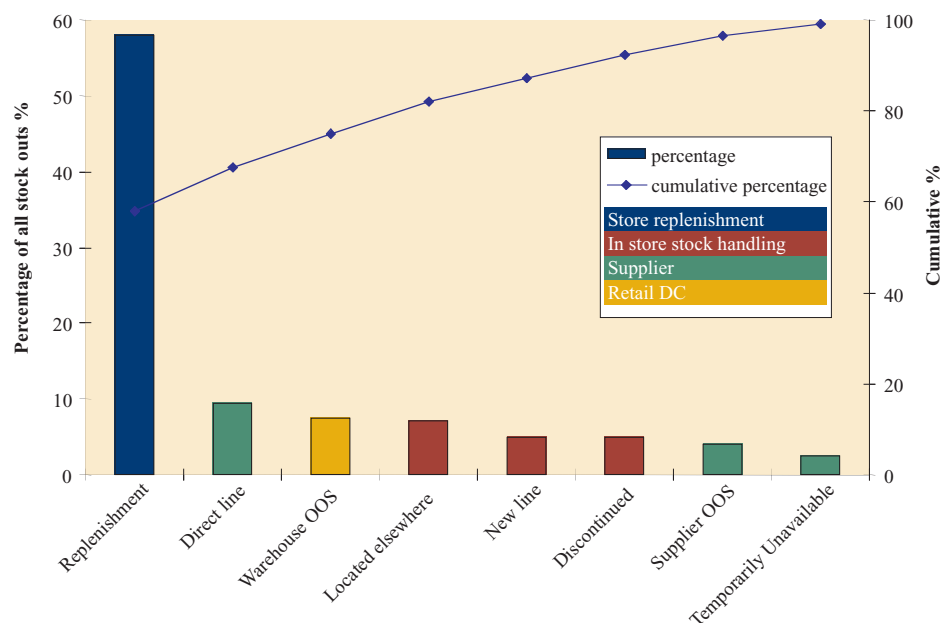


Figure C.1: Pareto analysis of causes of out-of-stocks at Franklins

Key learning

Key lessons from this first project were:

- Stock-out root cause analysis is necessary in order to understand the nature of stock-outs and how to reduce them
- Most stock-outs are due to in-store reasons
- Collaboration with manufacturers is needed.

Project 2: The “red dot” project

Process

The second project began in June 2000 and ran for 20 weeks in 137 stores. The project was conducted in conjunction with 13 of Franklins’ key suppliers, who were asked to list ten items, that they deemed to be either their top selling lines or those with high out-of-stock rates, which they would like to monitor.

Red dots were placed on the shelves next to items chosen and a target was set of 100% stock availability every time items were checked. Forms were given to the suppliers’ representatives (merchandisers) and they were asked to monitor the level of out-of-stocks. For identified stock-outs, Franklins staff supplied root causes and reported back to the Market Inventory Manager. The latter then led initiatives to address root causes, including one-to-one training on the store replenishment system for stock controllers, to teach them how to make manual adjustments to the system in the most efficient manner.

Although Franklins and their suppliers were aware of the trade-off between increased product availability and the increased labour and inventory costs (see Chapter 1 ‘The opportunity’), the goal of 100% in-stock provided a clear focus for the project and enabled it to demonstrate that directly targeting out-of-stocks could impact the products that Franklins and their suppliers felt were most at risk.

Results

The team involved in the project expected to see a trend showing that as out-of-stocks were reduced, sales would increase. A number of the suppliers involved in the project did show this trend, including:

- Procter & Gamble saw a reduction in stock-outs from around 19% to 9% and over the same time frame achieved a trended growth of around 14%
- Coca-Cola Amatil observed stock-outs reduced from 11% to 5.5%, with a growth in sales of 33% for the products that were monitored.

The main root causes of out-of-stocks appeared to be:

- limitations in the current demand forecasting process and systems meant that replenishment was not fast enough to react to increases in consumer demand
- issues with demand estimates for promotions
- inappropriate shipper sizes (eg one supplier often ran out of stock as the shipper sizes they used were smaller than their competitor, who often had excess stock due to a larger shipper size)
- inappropriate fixture space (eg health and beauty product often tended to have a small fixture space, placing more reliance on in-store handling)
- manually ordered promotions disrupted the automatic store ordering system.

Key learning

Key lessons from this second project were:

- Focus on certain products leads to fewer out-of-stocks. The best result achieved was a stock-out reduction from 22.9% to 2.82% in the biscuit category
- Sustainability is a major issue. Reduced focus towards the end of the project led to out-of-stocks rising again
- There is a correlation between reduced out-of-stocks and increased sales for suppliers. Several suppliers were able to show this for their products
- There is a correlation between reduced out-of-stocks and increased sales for retailers. Franklins total sales of targeted products showed a trended increase of around 5% over the 20 weeks of the project
- Collaboration between retailers and suppliers offers a “win-win” approach to stock-out reduction.

During the project there was a “push” effect from suppliers on inventory holding and a “pull” effect generated by the need to pre-order stock for expected increases in consumer off-take (eg from promotions). It was recognised that retailers face a difficult task of achieving the right stock “mix” and avoiding the position of having too little of the right stock, or too much stock which can have a significant financial impact on retail businesses. Managing the trade-off between enough and too much stock is a delicate balance and one that improved collaboration in demand forecasting and inventory management across both supplier and retailer can assist.

Project 3: Ongoing stock-outs measurement

Process

Building on the knowledge and experience gained from the previous two projects, Franklins commissioned a third project using a third party service provider, *Brands On Show*, to manually count out-of-stocks at 100 stores per week. This sampling rate allowed all Franklins stores to be covered at least once every four weeks. The aim of this project was reduce out-of-stocks by improving the information available to store and inventory managers. Specific objectives were included in individual manager KPIs, which in turn influenced their bonus.

The markets received an itemised list of their out-of-stocks within 24 hours so that they could take appropriate action. Stores with the most out-of-stock problems were identified and Franklins provided coaching and support to help the store managers improve their ability to identify and remedy the problem.

Results

This process is ongoing and is providing Franklins with a means to identify and address specific replenishment issues. Results of stock-out surveys can be collated and made available within a few hours of the store sampling taking place. This addresses several issues from the first two projects: the older the data, the greater the time between discovering the stock-out and addressing it; and the more difficult to capture root causes. Ongoing stock-out measurement is also providing a large enough sample size for trended statistics and a basis for decision making, both at an individual store/category level and at a total business level.

Conclusions

The development of the Franklins approach has been an evolutionary one, but throughout all three projects the identified major causes of out-of-stocks have been consistent. These can be categorised into the following three main areas:

- the store replenishment process
- supply to stores
- in-store stock handling and fixture management.

From the survey data, it appears that there is a need to maintain a consistent focus over time to achieve a sustained reduction in out-of-stocks. It has also become evident that for most out-of-stocks to be addressed, information needs to be passed to the replenishment system in a timely and accurate fashion, with clear guidelines for manual interventions to avoid over-corrections.

These projects have clearly shown that consistent and focused collaborative efforts can impact stock-outs; and stock-out reduction can in turn impact the business, particularly for products with a high economic value to both manufacturers and retailers. Franklins has also recognised that the solution to out-of-stocks is not simply to target a single issue, but that it is important to improve the end-to-end supplier/retailer process and to resolve the specific causes of retail out-of-stocks.

Subsequent Actions

The results listed are focused on specific issues, actions and results. However Franklins has recognised that long-term solutions require systemic changes to the replenishment process. As part of an ongoing process to develop a more efficient supply chain, Franklins have made conscious and positive interventions in their own business processes. Franklins have now rolled out RF ordering processes in both store and warehouse environments. They have also instigated a program of broad based training in their retail stores and are developing standard operating procedures to provide additional structure to the store replenishment process and to improve consistency in application. These recent changes, together with collaborative efforts with suppliers, have already resulted in examples of product availability as high as 98%. The ongoing challenge is to ensure the right product is available to the shopper, whilst minimising oversupply.



Appendix D: Efficient replenishment KPIs

Using KPIs to reduce stock-outs

KPIs (key performance indicators) should be used in two ways. Firstly, as indicators of the present status of stock-outs in the supply chain; and secondly; to drive performance improvement—individuals and teams being measured on specific KPIs and achievement of targets.

The key KPI is percentage of stock-outs on the retail shelf, however this is a lagging indicator—it indicates what has happened. Best practice emphasises leading KPIs. These are measures that indicate, in advance of stock-outs on shelf, how efficient the replenishment process is.

This appendix contains:

- definition of stock-out on shelf
- definition of stock-out in the DC
- listing of other KPIs.

Further information on KPIs may be found in the ECRA publication 'A Guide to KPI Development within the Grocery Industry' (2000).

Definition of stock-out on shelf

This is defined in the ECRA KPI guide as “SKUs experiencing stock-out on any retail shelf as a percentage of total range”.

The calculation is defined as:

$$\frac{\text{Average number of SKUs out of stock per week} \times 100\%}{\text{Average total number of SKUs intended to be on shelf}}$$

“Out-of-stock” is defined as the stock not being on shelf, in the right place, for the consumer to be able to find it.

The measurement frequency should be at least quarterly—more frequently for focus categories.

Definition of stock-out in the DC

This measure is not defined in the ECRA KPI guide as it is a secondary measure from a total ECR perspective. (Service level DC to store being the primary measure.)

A stock-out in the DC is defined here as “SKUs experiencing stock-out at the DC as a percentage of total range”.

The calculation is defined as:

$$\frac{\text{Average number of SKUs out of stock per week} \times 100\%}{\text{Average total number of SKUs intended to be in the DC}}$$

“Out-of-stock” is defined to include stock that is lost or damaged or otherwise unavailable for shipment, ie if all stock is lost, that product is effectively out-of-stock.

The measurement frequency should be weekly, as this measurement should be part of everyday DC operation.

Both the in-store stock-outs and the DC stock-outs are useful not only for tracking efficient replenishment performance but also for root cause analysis and, through this, for continuous improvement.

Listing of other KPIs

These KPIs are all detailed further in the ECRA KPI guide:

- forecast demand error (WAPE)—this should be measured at DC level and at store level
- service level: manufacturer to retailer DC
- service level: retailer DC to store
- service level: manufacturer DC to store
- inventory days of stock—retail store
- inventory days of stock—retailer DC
- inventory days of stock—manufacturer
- scheduled load/unload adherence.

For enabling technologies:

- quality barcoding (case)
- quality barcoding (pallet)
- data integrity rate (transmitted and received).

There are also a number of secondary KPIs (not listed in the ECRA KPI guide) which can be used to measure the performance of business processes which are commonly identified as the root causes of stock-outs. For example:

- stock-on-hand accuracy (measured when periodic stock counts are completed)—both at store and DC levels
- store order replenishment leadtime—the time taken from identification of the replenishment requirement, through order placement to product delivery to the store
- stock-lows—defined as “SKUs experiencing stock less than MPL on any retail shelf as a percentage of total range”
- sales in excess of forecast—this measure may, for example, highlight products with sales volumes in excess of sales forecasts by more than 25%, so that particular attention may be paid to these items to avoid stock-outs.



Appendix E:
Sample retail shelf stock-out diagnostic

Sample stock-out diagnostic

The sample diagnostic described here is based on that used by the Procter & Gamble 'European Shelf Availability Task Force'. It should be modified according to the circumstances and priorities of the user. It incorporates immediate actions to restock the shelf as well as a rigorous root cause analysis.

The basic methodology is shown in Figure E.1.

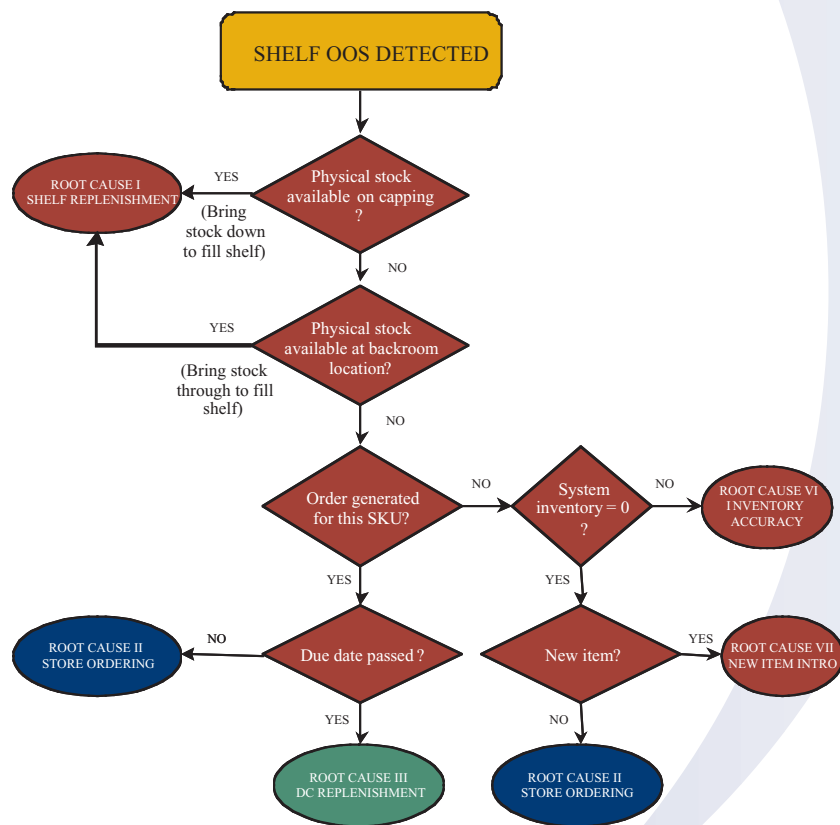


Figure E.1: Basic root cause analysis diagnostic

A more detailed “on the spot” root cause analysis is shown in figure E.2. This could be performed with the aid of a PDET on a regular basis.

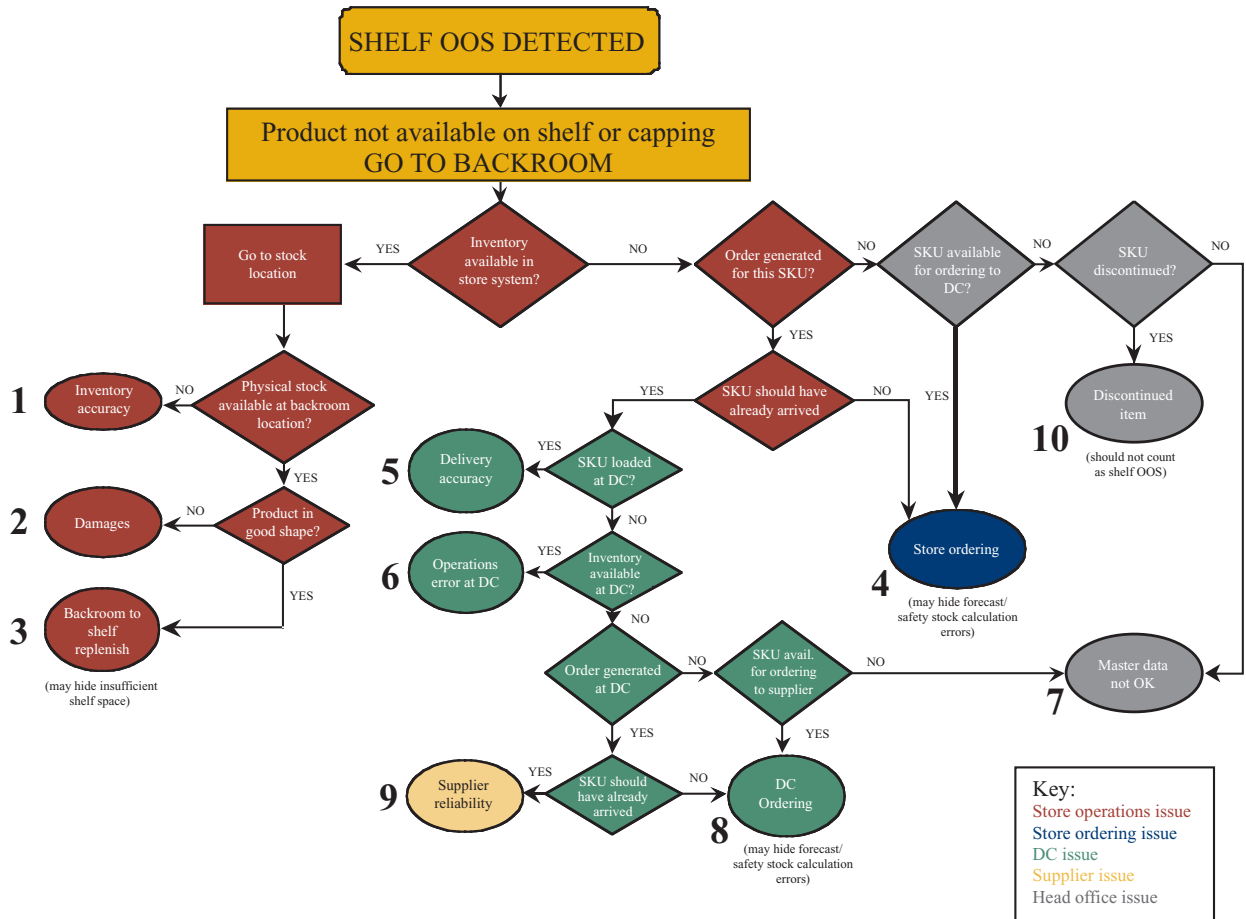


Figure E.2: Detailed root cause analysis diagnostic



Appendix F: References to other work

References to other work

This guide to reducing stock-outs through efficient replenishment would not have been possible without the help of previous work done both by ECRA and by other ECR aligned initiatives around the world.

In particular we have referenced:

- 'The Retail Problem of Out-of-Stock Merchandise', The Coca-Cola Retailing Research Council, 1996
- 'A Guide to Demand Forecasting within the Grocery Industry', ECRA, 2000
- 'A Guide to KPI Development within the Grocery Industry', ECRA, 2000
- 'The Australian Grocery Industry in 2005', a PricewaterhouseCoopers report, 1999



Appendix G: Glossary

Term	Explanation
CPFR	Collaborative planning, forecasting and replenishment.
AFGC	Australian Food and Grocery Council.
APS	Advanced planning and scheduling system. A decision-support system for demand and supply planning.
CMI	Co-managed inventory. A process whereby a manufacturer manages the replenishment of inventory to a customer warehouse or store based on mutually agreed rules.
DC	Distribution centre.
DIFOT	Delivery in full on time.
EAN	European article numbering.
ECR	Efficient consumer response.
ECRA	Efficient consumer response—Australasia.
GISCC	Grocery industry supply chain committee.
GTIN	Global trade item number.
IRA	Inventory record accuracy.
MPL	Minimum presentation level—the minimum on-shelf stock to avoid a negative low stock reaction from the consumer.
OOS	out of stock. If not explicitly stated otherwise, this is out of stock on the store shelf.
OTD	On-time delivery.
OTIF	On-time in full (see DIFOT).
PDET	Portable data entry terminal—personal computer chip based units with a small display screen, a keypad and a scanning device for barcode reading.
ROI	Return on investment.
Relay	Changing of the layout of products on shelf (in USA this is a “shelf reset”).
SKU	An item at a location. For example one product that is stored in two warehouses represents two SKUs.
SOH	Stock-on-hand.
SSCC	Serial shipping container code.
VMI	Vendor managed inventory.



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