

JBA 2022

JBA-22-093

Q1-A: Automation of online fulfilment

Name: Julia Wood

Introduction

As online penetration soars retailers are being forced to adapt to an increasingly dual-channel demand for their goods. This brings positives for our Australian supermarket retailers. Shoppers online are more loyal to their chosen retailer and spend on average 2.3x more per transaction when compared to in-store¹. But there is one glaring negative – cost to service online demand is far higher than a typical in-store experience². Our retailers must find a way to reduce cost per serve, while simultaneously providing a seamless user experience for shoppers who are becoming savvier and more demanding of the service.

This paper focusses on four online order fulfilment models

1. Large scale automated fulfilment
2. Micro automated fulfilment
3. Manual dark stores
4. In-store manual picking

There are pros and cons to each of these methods and, taking learnings from more advanced grocery E-Comm markets, it is clear there is no one-sized fits all approach – particularly for Australia. With a combination of dense, inner city populations along with urban sprawl in some states, Australian retailers will need a multi-faceted fulfilment approach combining larger-scale automated warehouses with smaller-scale fulfilment requiring human touch. This will enable them to reach large cross-sections of shoppers in a timely fashion and balance the high set up cost / low cost per pick of large scale automation, with the lower establishment cost / higher cost per pick of smaller scale operations.

The current state

Australia is the 6th largest country in the world, with the 56th largest population³. Population density in our capital cities (and surrounding suburbs) varies by state with the ACT (100%) and Western Australia (78%) having the most centralised population, down to the vast state of Queensland where just 48.1% of the population resides in and around Brisbane⁴

Not only are retailers troubled with servicing shoppers across our immense nation, these shoppers will become increasingly demanding in terms of the time they are willing to wait for delivery, the delivery window they will accept, and the price they are willing to pay for that convenience⁵.

While small, Australian grocery newcomers like Milk Run and Send who boast delivery in 10-15mins from the time of order with no delivery fee⁶, will over time change shoppers' scope of reference for what is deemed convenient, timely, and value for money. This can be viewed in a

¹ IRI (2021), *Grocery Market Moves 2021 Presentation*

² Citi Research (2020), *Australian Retail: Retail's eCommerce Renaissance (17/09/2020)*

³ World Population Review 22. Available at: <https://worldpopulationreview.com/countries>

⁴ ABS 2012-2013, *Regional population growth*

⁵ Mitchell, S (2021), *Woolworths to automate online grocery orders*, Australian Financial Review. Available at: <https://www.afr.com/companies/retail/woolworths-to-automate-online-grocery-orders-20210427-p57moc>

⁶ Bencic, E (2021), *Online-only supermarket delivers groceries in 15 minutes or less*, Retail Biz. Available at: <https://retailbiz.com.au/online-retailing/online-only-supermarket-delivers-groceries-in-15-minutes-or-less/>

similar way to which the Iconic & ASOS shook up E-Commerce fashion retailing with their speedy delivery and convenient returns process – forcing others to pivot and adapt, or risk being left behind⁷.

We must take into account our large land mass, population sprawl and this increasing shopper demand for flexible, timely & cheap delivery when considering which online fulfilment model (or combination of models) is suited to our market. These factors must be considered alongside cost and pace of establishment, ongoing cost per grocery pick and shopper experience.

Large Scale Automated Fulfilment Centres

Ocado, a provider of large scale automated fulfilment centres, boasts its warehouses to be configured to

“accommodate much greater storage capacity than large store-based alternatives, with scalable product range and volumes⁸.”

Algorithms control where products are located, and robot arms work to sort, pick and deposit items for human packing. Where economies of scale are present this process is more efficient, in both time and ongoing cost per grocery item picked, than a typical manually run warehouse⁹. This is the key advantage of large scale automated fulfilment.

But, this fulfilment model has three key drawbacks. Firstly, the high cost of establishment. Coles is reportedly spending \$150m on two large scale automated CFC's in Sydney and Melbourne, while the price tag for Woolworth's automated 22,000m² facility in Auburn is expected to top \$100m¹⁰.

Secondly, lengthy build times means a retailer not effectively set up to cope with customer demand in the short-medium term risks being left behind by competitors with more agile approaches. Coles, who announced their Ocado partnership in early 2019 does not expect their first CFC to be operational until 2023¹¹.

This high one-off cost, large scale footprint, and lengthy build time means it is not feasible to have warehouses dotted in high numbers across our vast nation. This leaves service limited to smaller distribution areas or subject to higher cost/slower delivery. Estimates from Kroger's Ocado fulfilment centres in the US suggest a delivery radius of up to 90 miles¹². This is the third key drawback of an exclusively large scale automated warehouse model.

⁷ Business View (2017), *Delivering the goods is THE ICONIC ethos*, NAB Business. Available at: <https://business.nab.com.au/delivering-goods-iconic-ethos-23641/>

⁸ Ocado Group, *What is OSP?* Available at: <https://www.ocadogroup.com/our-solutions/what-is-osp>

⁹ Vincent, J (2018), *Welcome to the automated warehouse of the future*, The Verge. Available at: <https://www.theverge.com/2018/5/8/17331250/automated-warehouses-jobs-ocado-andover-amazon>

¹⁰ Mitchell, S (2021), *Woolworths to automate online grocery orders*, Australian Financial Review. Available at: <https://www.afr.com/companies/retail/woolworths-to-automate-online-grocery-orders-20210427-p57moc>

¹¹ Coles (2019), *Coles enters partnership with Ocado*, Coles Media Releases. Available at: <https://www.colesgroup.com.au/media-releases/?page=coles-enters-partnership-with-ocado>

¹² Redman, R (2021), *Kroger debuts first Ocado automated fulfillment centre*, Supermarket News. Available at: <https://www.supermarketnews.com/technology/kroger-debuts-first-ocado-automated-fulfillment-center>

Retailers have realised this, opting to use these warehouses in conjunction with smaller fulfilment options closer to their end shoppers.

- Sobeys in Canada, despite highlighting they expect to be able to serve approximately 75% of all Canadian households from just 4 large scale CFC's¹³, have also diversified their pick and delivery options. They have introduced manual in-store picking and click and collect services, expecting to expand this to hundreds of stores in the future. This smaller scale, manual process is designed to support shoppers where CFC's are not currently operating, or will never service¹⁴
- Tellingly, Morrisons in the UK, Ocado's longest standing partnership (commencing in 2013) also recently loosened its ties to the fulfilment provider, allowing the retailer to work with the likes of Amazon, Deliveroo, and other partners. This opens "new opportunities such as ultra-fast deliveries"¹⁵ and is said to be necessary in finding new growth opportunities in the more mature online grocery market"¹⁶.

Micro fulfilment centres

On face value, micro automated fulfilment centres solve these key issues faced by larger scale fulfilment options – namely, proximity to shoppers (and therefore delivery speed and cost), cost and time to establish, and space footprint. Takeoff (partnering with Knapp), one of the leading providers of micro fulfilment centres and technology, boasts the below - a seemingly perfect solution.

Figure 1¹⁷

¹³ Empire Company Limited Annual Report 2021. Available at: <https://www.empireco.ca/wp-content/uploads/2021/07/2021-Empire-AR-English-SEDAR.pdf>

¹⁴ Ibid

¹⁵ Butler, S (2019), *Morrisons free to use Amazon and Deliveroo in looser Ocado deal*, The Guardian. Available at: <https://www.theguardian.com/business/2019/may/09/morrisons-free-to-use-amazon-and-deliveroo-in-looser-ocado-deal>

¹⁶ Quinn, I (2019), *Can the Morrisons-Ocado split really be a win-win?* The Grocer. Available at: <https://www.thegrocer.co.uk/online/can-the-morrisons-ocado-split-really-be-a-win-win/593434.article>

¹⁷ Takeoff.com, *Why Takeoff*



Profitable

Takeoff offers the only eGrocery solution that generates profits. We are transforming eGrocery into a viable option for you and your customers.



Reliable

We partnered with KNAPP, a global leader in automated picking technology. KNAPP has been building reliable and efficient hardware for over 50 years.



Scalable

Our Microfulfillment Center only takes up 1/3 of a traditional store's space, and can be assembled in a matter of months.



End-to-end solution

Our flexible end-to-end solution covers everything you need: customer UI, assortment, fulfillment, spoke routing, pickup/delivery, and replenishment!



Streamlined operations

Our Microfulfillment Center can assemble an average order in fewer than 15 minutes. That's 10x faster than manual picking in a store!



Hyperlocal

We have the flexibility to place our Microfulfillment Center so close to where customers live and shop, that we drastically reduce the last-mile cost.

But, like larger scale automated fulfilment options, this solution also has its drawbacks.

While cheaper to establish per centre compared to larger scale alternatives there are still significant build costs – estimated to range from a few million to \$10m¹⁸

Marc Wulfraat, president of MWPVL International, frequently consults with retailers on MFC technology and says the micro fulfilment solutions

“require a higher volume of incoming orders than many grocers realise to justify their hefty price tags... grocers are struggling to come out ahead financially in the face of ongoing costs, like transaction fees of up to several cents per unit shipped, and system maintenance”¹⁹

In addition, the smaller size of these warehouses mean it is not always possible to maintain 100% of a physical store's assortment. This can necessitate separate picking in nearby stores to supplement orders – adding cost, complexity and time²⁰.

In areas of high population density it's feasible micro fulfilment centres would have the economies of scale to provide low cost fulfilment of shopper orders, with fast pick and delivery. But, like macro fulfilment, this won't be a solve-all solution. Manual picking from stores or dark stores will be required to supplement where demand does not justify establishment and ongoing costs.

Manual in-store picking

Manual in-store picking is currently the most wide-spread online order fulfilment method in Australia. It eliminates the establishment cost of both automated models discussed and, high demand is not required to provide the service - staff required to fulfil orders can be

¹⁸ Wells, J (2021), *Is micro-fulfillment tech living up to the hype?* Supply Chain Dive. Available at: <https://www.supplychaindive.com/news/micro-fulfillment-tech-cost-hype-grocery-supply-chain/602523/>

¹⁹ Ibid

²⁰ Ibid

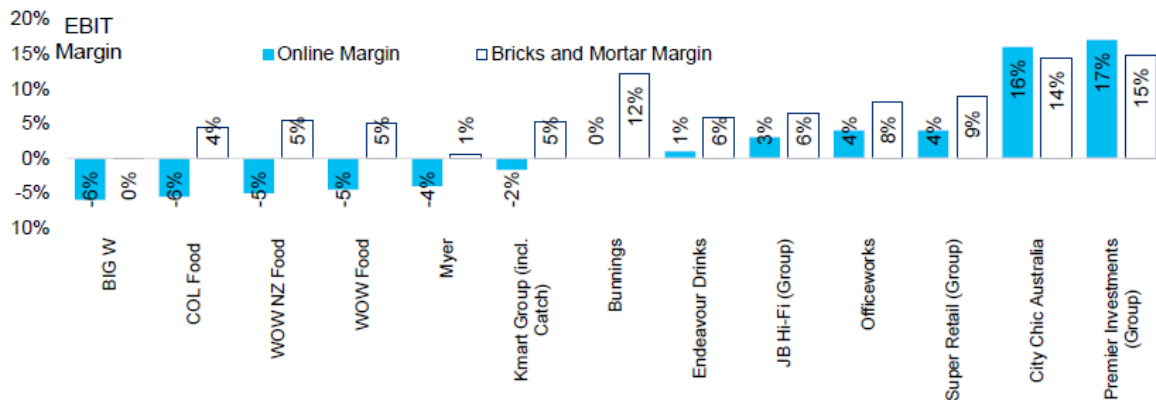
flexed as demand builds. Our major retailers have established store networks and 80% of Australian shoppers on average live within 1.8kms of a major supermarket chain²¹. This makes same day delivery feasible to high numbers of shoppers (albeit still at a cost to either retailer or shopper). Click and collect options are also easily provided.

But, while cheap to establish, this method has high ongoing costs due to the manual handling. Each order takes on average 30 minutes to pick by a dedicated staff member²². With labour one of the two main costs of doing business in Australian retail²³ (along with occupancy costs), further adding to the manual handling of product prior to it reaching the shopper increases this expense.

Online profitability claims vary. City Bank estimates show negative online profit margins for our key supermarket retailers, after allocating store level costs²⁴.

Figure 2²⁵

Online margins below bricks and mortar, after store-level costs are allocated



Source: Company Reports, Citi Research estimates

But in 2019, Coles and Woolworths did announce profitable online sales (after 20 years' operating in the red)²⁶. However, we can agree online sales are at least dilutive to in-store profit margins²⁷.

Despite its easy establishment, the high cost of labour per order will remain the key limiting factor for manual order fulfilment.

²¹ Doherty, S (2019), *How many supermarkets are too many?*, Market Grunt. Available at: <https://www.marketgrunt.com.au/post/how-many-supermarkets-are-too-many>

²² Mitchell, S (2020), *Woolworths speeds online orders with micro-fulfilment*, Australian Financial Review. Available at: <https://www.afr.com/companies/retail/woolworths-speeds-online-orders-with-micro-fulfilment-20201007-p56309>

²³ Australian Government Productivity Commission (2014), *Relative costs of doing business in Australian Retail Trade*, Productivity Commission Research report. Available at: <https://www.pc.gov.au/inquiries/completed/retail-trade/report/retail-trade.pdf>

²⁴ Citi Research (2020), *Australian Retail: Retail's eCommerce Renaissance* (17/09/2020)

²⁵ *ibid*

²⁶ Bajkowski, J (2019), *Woolworths follows Coles, says online sales profitable, now 4.2%*, itnews. Available at: <https://www.itnews.com.au/news/woolworths-follows-coles-to-claim-online-sales-profitable-now-42-percent-530328>

²⁷ *ibid*

Manual dark stores

Manual dark stores are used by traditional retailers, like Tesco, Sainsbury and Woolworths²⁸, as well as speedy delivery, online-only newcomers like Zapp (UK) and Milk Run (Australia)²⁹.

Short turn-around times are possible, despite still requiring manual labour for picking orders. Without the need to service traditional in-store demand, SKUs in a dark store can be arranged according to a “typical” online grocery order. Products with high demand (relative to an in-store shop) like toilet paper, nappies and bottled water can also be held in larger volumes³⁰.

These changes, along with eliminating the added obstacle of shoppers, allows an employee to pick an order reportedly up to 3x faster than one working in a traditional store³¹.

These stores are viable for areas where demand does not meet the necessary levels to warrant investment, or does not meet the space requirements of an automated warehouse. As with all solutions discussed, they are best used in an overall fulfilment strategy, not simply as a standalone solution.

Summary

The below table highlights pros and cons of the online fulfilment options discussed. This view uses generalities and averages – an automated large scale fulfilment centre may be the closest fulfilment option to some shoppers for example, just not for the majority.

Proximity to shoppers is also used as a proxy for delivery speed which, depending on how each provider chooses to manage order dispatch, may not always be the best measure.

Finally, some measures are harder to quantify. Customer experience involves more than just timely and convenient delivery. The shopper-facing system is crucial to shopper experience, and repeat use of an ordering platform.

Cost of delivery to retailers is also tricky to compare across fulfilment options. One may assume the closer proximity to shoppers of smaller scale options would lessen delivery fees but, on the flip side, the high volume of orders going through a larger scale facility can enable efficient route mapping, reducing cost per delivery.

²⁸ Mitchell, S (2014), *Woolworths opens first online-only ‘dark’ store*, Australian Financial Review. Available at: <https://www.afr.com/companies/retail/woolworths-opens-first-online-only-dark-store-20140811-jkeic>

²⁹ SEND, <https://www.sendapp.com.au/>. & Milkrun, <https://www.milk.run/>

³⁰ ³⁰ Mitchell, S (2014), *Woolworths opens first online-only ‘dark’ store*, Australian Financial Review. Available at: <https://www.afr.com/companies/retail/woolworths-opens-first-online-only-dark-store-20140811-jkeic>

³¹ *ibid*

Figure 3

	Automated Large Scale Fulfilment Centres	Automated Micro Fulfilment Centres	Manual in-store	Manual Dark Stores
Examples of Global FMCG Retailers using/investing in	Sobeys, Kroger, Ocado,	Kroger, Wholefoods	Sobeys, Kroger, Wholefoods	Tesco, Sainsbury
Aus FMCG Retailers using/investing in	Coles	Woolworths	Coles, Woolworths	Woolworths, Milk Run, Send
Ease of shopper experience	?	?	?	?
Ongoing cost per pick	1	2	4	3
Efficiency/speed of order picking	1	2	4	3
Proximity to end shopper / speed of delivery	4	3	1	2
Cost of delivery	?	?	?	?
Cost of implementation	4	3	1	2
Pace of implementation	4	3	1	2

1 being the best performer of the four options, 4 being the poorest performer of the four options

Conclusion

As we are learning from supermarket retailers around the globe, the best online fulfilment method is a diverse one. Densely populated cities will be better served by automated fulfilment scaled according to population density and space available. The ongoing lower cost of serving these shoppers will, over time, negate the high initial investment required. The fast pick and delivery speeds (to the area it services) will also provide increasingly demanding shoppers with the ease and convenience they crave.

But, these facilities are not suited everywhere. Manual dark stores, and manual in-store picking will be required to supplement automation in areas where economies of scale are not sufficient to justify the upfront investment, and ongoing running costs. Despite taking longer to pick an order, the close proximity to shoppers has the potential to still enable flexible and speedy delivery, albeit at a higher cost to serve.

While each individual order from a manual site will be more costly to the retailer on an ongoing basis, savings from using automation in appropriate areas will enable progress towards closing the gap to in-store profitability. As online penetration grows (or retailers succeed in growing market share), feasibility of automated solutions in more regions increases, particularly as the technology price comes down.

There is no silver bullet. We must diversify fulfilment options to balance profitability and shopper experience. The retailer who is able to seamlessly connect this complex back-end fulfilment structure with a user-friendly customer-facing system will take the spoils.