

# Joe Berry Award 2022

Entry – JBA-22-078

**Topic: 1      Question: A**

**Automation of Online Fulfilment**

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## Introduction

The World Wide Web. The steam engine. The chocolate bar.

Great Britain is responsible for some of mankind's greatest innovations. But while society may have reached the pinnacle of achievement with some advancements (see: Snickers bars), others are in a state of relative infancy. Amongst these is one of Britain's lesser-known creations: next-day delivery.

In the obscure Welsh village of Llanllwchaiarn in the mid-1800s, humble flannel-maker Pryce Pryce-Jones started taking mail-in orders, utilising stagecoach and the expanding British railway network for fulfilment. By optimising production and brokering deals for daily distribution, Pryce-Jones was able to offer a truly unique selling point at the time: convenience.

Almost two centuries later, billionaire Jeff Bezos spearheads a flock of behemoths vying for your wallet's loyalty, venture capitalists amass upon near-instant delivery start-ups, and immediacy remains the pervasive goal.

This essay evaluates the merits of the various fulfilment models used in online retailing globally. It achieves this by assessing the current retail landscape, before analysing fully automated fulfilment centres, micro-fulfilment centres (MFCs) through the lens of grocery delivery services, and new technologies supplementing supply chains.

It will be asserted that:

1. Retailers reducing their physical store footprints are mistaken
2. Automation is essential, but not enough to win alone
3. Near-instant delivery start-ups will not succeed, but have redefined convenience forever
4. New technologies must be adopted to stay relevant

The concluding recommendation is for retailers to utilise a balanced assortment of physical stores, fully automated fulfilment centres, MFCs, and new technologies in an omnichannel fulfilment strategy.

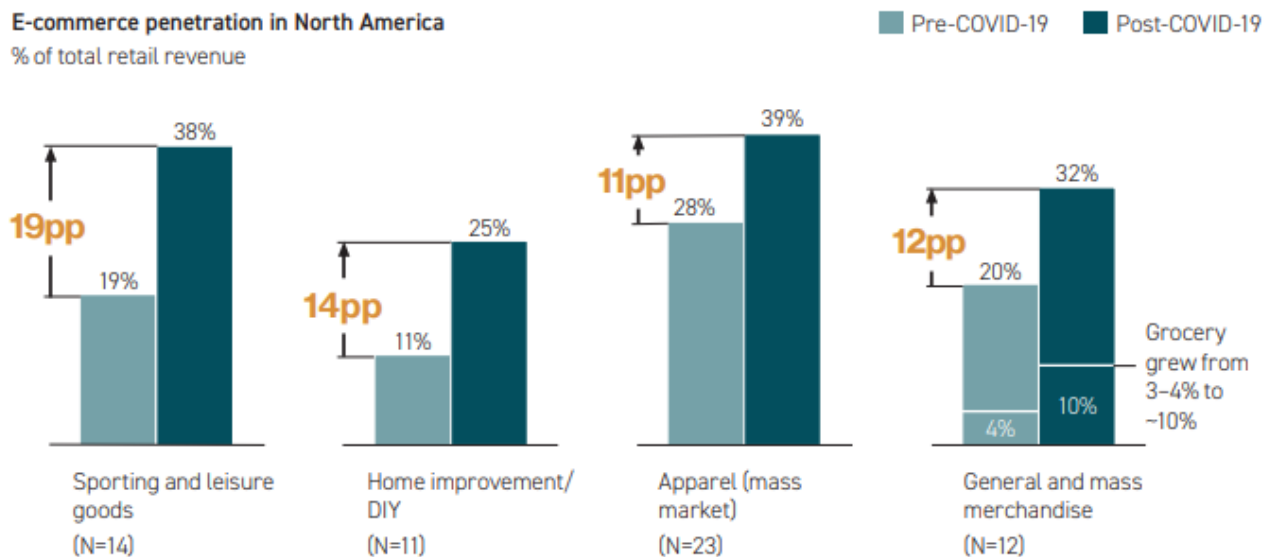
This is the golden ticket to success.

## Current landscape: more clicks, less bricks

As online penetration rises in the \$5 trillion-a-year global retail market<sup>1</sup>, businesses have been turning to automated fulfilment centres at the heart of their supply chains. Many of these sites are not being developed in addition to store networks, but to supplement the decreasing physical footprint in the retail sector.

Research from the KPMG CEO Outlook 2021 revealed 69% of CEOs plan to downsize (or already have) their physical store networks.<sup>2</sup> The pandemic didn't instigate this trend, it merely expedited it. In 2019 there were over 9000 store closures in the US alone, almost 60% more than in 2018.<sup>3</sup>

**E-commerce penetration in North America**  
% of total retail revenue



**4 Exhibit 1: Increasing online penetration is compelling retailers to close stores**

With store closures continuing to outpace openings (at a current rate of 2:1), retailers have been pivoting to smaller format stores (Bloomingdale's, Macy's)<sup>5</sup>, experiential flagships (Nike 'Live', Dollar General's 'Popshelf', Dick's 'House of Sport'<sup>6</sup>) and a plethora of shop-in-shops (Target, Bloomie's, Kohl's, Bed Bath & Beyond, Nordstrom's).<sup>7</sup>

<sup>1</sup> <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>

<sup>2</sup> <https://home.kpmg/au/en/home/insights/2021/03/ceo-outlook-pulse.html>

<sup>3</sup> <https://www.retaildive.com/news/store-closures-pass-9k-in-2019/569597/>

<sup>4</sup>

<https://www.mckinsey.com/~media/McKinsey/Industries/Retail/Our%20Insights/retail%20speaks%20seven%20imperatives%20for%20the%20industry/retail-speaks-full-report.pdf>

<sup>5</sup> <https://fortune.com/2021/07/07/bloomingdales-bloomies-small-store-macys/>

<sup>6</sup> <https://www.retaildive.com/news/whats-in-a-flagship/584366/>

<sup>7</sup> <https://www.retaildive.com/news/7-experiential-store-concepts-that-opened-this-year/606809/>

These strategic pivots are necessary. The store closures, however, are narrow-sighted and represent a critical error of retailers. Stores still play a powerful and versatile role in connecting customers to brands. Research from CACI indicates that 37% of online spend is attributable to the halo effect of retailers' physical presence.<sup>8</sup> This is exemplified by Amazon's 17% brick-and-mortar sales increase in Q4 of 2021-their third double-digit quarterly sales increase in a row.<sup>9</sup>

Customers still value the sensorial experience and immediate gratification of physical shopping. Store outlets must not be viewed as single-purpose enterprises whereby in-store sales are the only metric of success.

Click-and-collect transactions contribute to the data evidencing increased online penetration, with the store pickup process remaining a crucial part of the customer's experience.<sup>10</sup> Bricks can drive clicks, and the proliferation of the latter should not prompt the dissolution of the former.

Retailers must leverage their existing store networks as a critical component of a holistic omnichannel offering. This point will be elucidated following a closer look into retailers' penchant for automation.

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<sup>8</sup> <https://pages.caci.co.uk/rs/752-EBZ-498/images/Insite%20report%202.pdf>

<sup>9</sup> [https://www.supermarketnews.com/retail-financial/amazon-brick-and-mortar-sales-climb-nearly-17-q4?NL=SN-09&Issue=SN-09\\_20220204\\_SN-09\\_819&sfvc4enews=42&cl=article\\_1\\_b&utm\\_rid=CPG06000060362221&utm\\_campaign=49630&utm\\_medium=email&elq2=53fb9d4648ad49bdaf4082156b622ed8](https://www.supermarketnews.com/retail-financial/amazon-brick-and-mortar-sales-climb-nearly-17-q4?NL=SN-09&Issue=SN-09_20220204_SN-09_819&sfvc4enews=42&cl=article_1_b&utm_rid=CPG06000060362221&utm_campaign=49630&utm_medium=email&elq2=53fb9d4648ad49bdaf4082156b622ed8)

<sup>10</sup> <https://www.mckinsey.com/industries/retail/our-insights/adapting-to-the-next-normal-in-retail-the-customer-experience-imperative>

## Fully automated fulfilment centres

Almost all manual tasks can now be conducted by fully automated and integrated robotics, sorters, and conveyors. It is no surprise that retailers froth at the numerous merits of these game-changing fulfilment centres:

- **Increased productivity and reduced operational costs**
  - The average human resource can pick approximately 60 cases per hour, whereas automated sorters and conveyors can pick up to 600.<sup>11</sup>
  - Superfluous labour can be redeployed to retail stores suffering from critical levels of pandemic-induced turnover, keeping experienced employees in-house while offsetting the soaring payroll costs attributed to recruitment.
- **Increased picking accuracy and capacity**
  - Automated Storage and Retrieval Systems (AS/RS) can pick at accuracy rates of up to 99.99%<sup>12</sup>, reducing double handling costs and improving the customer experience.
  - The processing flexibility that comes with the higher capacity for order quantities reduces peak season bottlenecks.
- **Improved workplace safety**
  - The reduction in manual labour required for tasks such as picking leads to a reduction in musculoskeletal issues, particularly repetitive strain injuries.
- **Space efficiencies and increased product range**
  - Fulfilment centres' higher density improves space utilisation by up to 50%<sup>13</sup>, with streamlined inventory management allowing for an increased SKU quantity to be stored, processed, and sold to customers.

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<sup>11</sup> <https://www.ny-engineers.com/blog/5-competitive-advantages-of-micro-fulfillment-centers>

<sup>12</sup> <https://www.sciencedirect.com/science/article/abs/pii/S0305054803003575>

<sup>13</sup> [https://scg-mmh.s3.amazonaws.com/pdfs/cimcorp\\_wp\\_4\\_benefits\\_030918.pdf](https://scg-mmh.s3.amazonaws.com/pdfs/cimcorp_wp_4_benefits_030918.pdf)

While corporate boardrooms delight at costs shifting from hefty payroll expenses to capital investment in automation, there are flaws to be considered:

- **Upfront capital expenditure**
  - The initial outlay of capital expenditure necessary to transition to fully automated warehouses is significant. This could pose a challenge to smaller players struggling to keep pace with the giants, or those for whom technological obsolescence is a risk too great.
- **The reliance on reliability**
  - AS/RS work according to pre-set criteria and are best suited for predictable and repetitive operations. Rapid changes to the core products or materials handled can lead to intermittent cost blowouts for businesses that don't benefit from consistent product mixes and order patterns.<sup>14</sup>
- **Distance to the consumer**
  - Large, fully automated fulfilment centres are often located outside of dense urban centres. In the race for immediacy, proximity to the customer is becoming less of a predilection and more of a prerequisite.

Evidently, fully automated fulfilment centres' ability to streamline operations provide a net benefit to retailers looking to maximise efficiencies. Amazon, Jaycar, Kogan, Drakes, Coles, and Woolworths have all invested hundreds of millions of dollars in automated DCs in the Australian market already<sup>15</sup>, with ALDI also signalling intent to join the party.<sup>16</sup>

Retailers will be left behind if they do not automate the hearts of their supply chains. However, the realised efficiencies of fully automated fulfilment centres will not replicate the convenience that customer proximity brings. Consequently, they should only represent a piece of the broader omnichannel fulfilment puzzle. MFCs also play an imperative role, as evidenced by the grocery delivery start-ups setting the market alight by redefining convenience altogether.

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<sup>14</sup> <https://www.conveyco.com/pros-cons-asrs-warehouse-automation/>

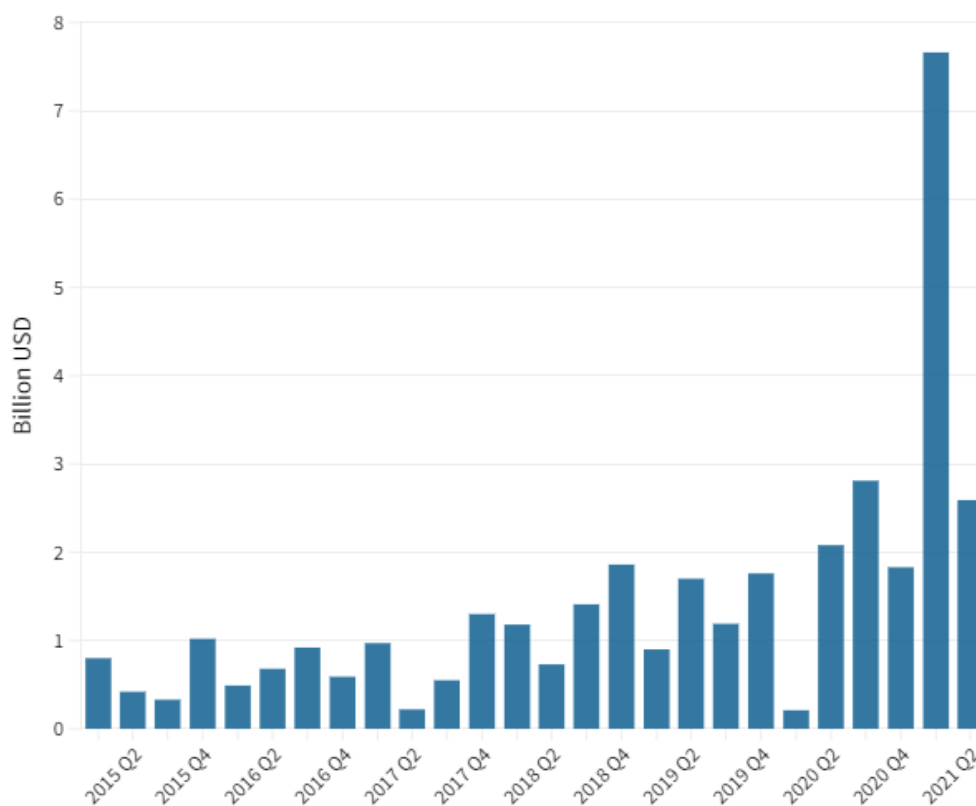
<sup>15</sup> <https://www.mondaq.com/australia/real-estate/983004/the-logistics-of-developing-large-scale-automated-warehousing>

<sup>16</sup> <https://www.aldiunpacked.com.au/aldi-signals-change-is-on-the-horizon/>

## The post-pandemic plunge into 10-minute delivery

“Every crisis accelerates some sort of model; this one accelerated e-commerce grocery penetration”, asserts Gorillas’ CEO and co-founder Kagan Sumer. “Some of this accelerated adoption will go back to traditional retail, but a significant amount of this peak is going to stay because of convenience.”<sup>17</sup>

Gorillas is amongst a flurry of vertically integrated start-ups promising groceries at retail prices, delivered in as little as 10 minutes. With venture capital funding catapulting its value above the \$1B mark<sup>18</sup>, Gorillas joins fellow Berlin-based newcomer Flink<sup>19</sup>, Turkey’s Getir<sup>20</sup>, China’s Xingsheng Youxuan<sup>21</sup>, and the US’ goPuff<sup>22</sup> and JOKR<sup>23</sup> in achieving unicorn status.



<sup>24</sup> Exhibit 2: Global VC deal activity in grocery delivery

<sup>17</sup> [https://www.bloomberg.com/news/articles/2021-05-26/gopuff-uber-delivery-hero-other-startups-enter-instant-delivery-business?utm\\_content=businessweek&utm\\_medium=social&utm\\_source=twitter&cmpid=socialflow-twitter-businessweek&utm\\_campaign=socialflow-organic](https://www.bloomberg.com/news/articles/2021-05-26/gopuff-uber-delivery-hero-other-startups-enter-instant-delivery-business?utm_content=businessweek&utm_medium=social&utm_source=twitter&cmpid=socialflow-twitter-businessweek&utm_campaign=socialflow-organic)

<sup>18</sup> <https://www.bloomberg.com/news/articles/2021-10-19/delivery-hero-leads-1-billion-funding-round-for-gorillas>

<sup>19</sup> <https://techcrunch.com/2021/12/09/flink-the-berlin-based-instant-grocery-startup-is-now-valued-at-2-85b-after-raising-750m-in-a-round-led-by-doorDash/>

<sup>20</sup> <https://www.bloomberg.com/news/articles/2021-03-26/getir-takes-turkish-unicorn-top-spot-on-2-6-billion-valuation>

<sup>21</sup> <https://retailasia.com/technology/news/tencent-invests-100m-in-online-grocery-startup-xingsheng>

<sup>22</sup> <https://www.businessinsider.com.au/gopuffs-valuation-reaches-15-billion-with-1-billion-funding-round-2021-7?r=US&IR=T>

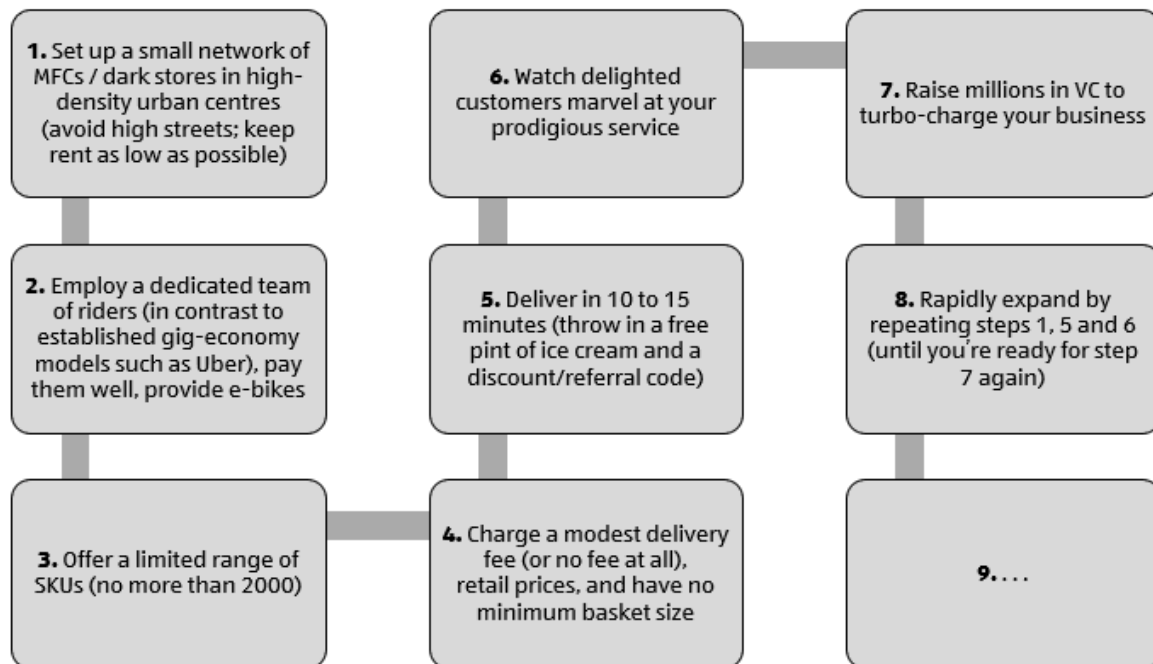
<sup>23</sup> <https://techcrunch.com/2021/12/02/instant-grocery-delivery-startup-jokr-bags-another-huge-round-to-enter-unicorn-status/>

<sup>24</sup> <https://www.cnbc.com/2021/07/02/grocery-startups-vc.html>



In a post-pandemic world showing signs of stability, grocery delivery start-ups are the primary disrupters. Traditional supply chains convulse in the presence of these guerrilla fulfilment strategies, with the Australian market the latest to quake.

MILKRUN, VOLY, and SEND (with their stylised capitalisation matched only by their impressive capital funding) all entered the Australian market in 2021<sup>25</sup>, following the tried and tested playbook of the aforementioned unicorns:



**Exhibit 3: Author's Own**

There's no Step 9 in the playbook- yet. The long-term sustainability of such a low-margin endeavour is questionable. While short-term market conditions have exposed fertile breeding ground for instant delivery services, the long-term conditions remain unfavourable. Australia's low population density and high wages are too strong a barrier to surpass. These start-ups may be trailblazing a new meaning of convenience, but are leaving a fiery pit of burnt capital in their wake. It won't last.

The paradox of the environment is that while it is improbable that these players will survive, they are setting new parameters for competitors (even indirect ones) to match. The utopia of near-instant delivery has arrived, and with it, revised customer expectations. In order to stay relevant, there appears only three options:

<sup>25</sup> <https://www.businessinsider.com.au/instant-delivery-service-milkrun-75-million-raise-expansion>

**1. Invest in, or acquire, one of the start-ups**

- Incumbents may be wise to delay an acquisition until the market matures or there is consolidation among the players; this will likely be necessary for them to avoid liquidation

**2. Supplement your existing supply chain with a network of MFCs**

- This is the recommended option, and will be expanded upon below

**3. Do nothing and hope for the best**

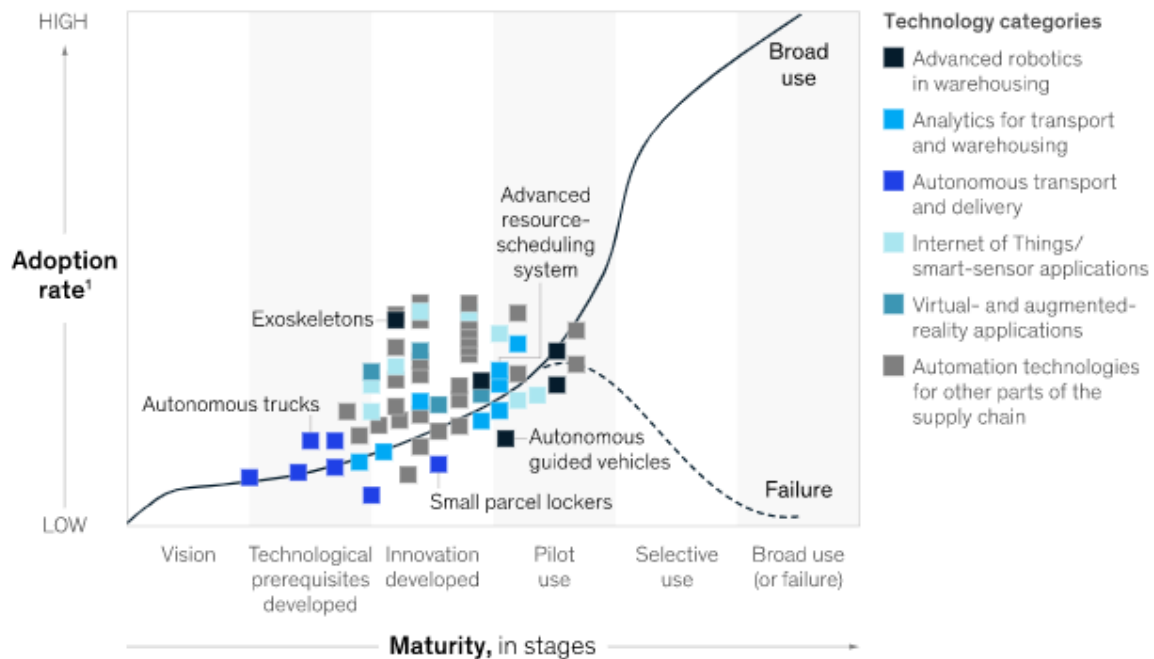
- Many seem reluctantly settled on this option. That will change. Retailers cannot sit idle as market share gravitates toward convenience

Networks of micro-fulfilment centres (whether bespoke MFCs or basement dark stores) are necessarily required to increase proximity to the customer and decrease the last mile, with vertical integration key to controlling costs. Fully automated fulfilment centres can remain the cornerstone of a supply chain, but the unique traits of MFCs cannot be replicated. The supply chains of tomorrow will require both as part of their omnichannel offering, and this will need to be supported and supplemented by new technology and innovations.

## Tapping into technology

Technological progression is driving advancements in physical retail outlets, fully automated fulfilment centres and MFCs respectively. While the Australian market is a later adopter of some technologies, it is a breeding ground for others, and no part of the supply chain is void of potential for innovation.

### Logistics-technology development



<sup>26</sup> **Exhibit 4: Dozens of logistics fulfilment technologies are under development; which will succeed in Australia?**

Automation, robotics, AI, and the IoT are the cornerstones of these innovations:

- Drone technology being piloted by IKEA<sup>27</sup> and KFC<sup>28</sup> cuts payroll costs, shortens the last mile, and can be a sustainable fulfilment alternative<sup>29</sup>
- Register bypass technology such as Woolworths' Scan&Go application<sup>30</sup> improves the in-store shopping experience

<sup>26</sup> <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/automation-in-logistics-big-opportunity-bigger-uncertainty>

<sup>27</sup> <https://www.retaildive.com/news/ikea-furniture-store-fulfillment-operations-automation/616814/>

<sup>28</sup> <https://www.cmo.com.au/article/695011/kfc-australia-makes-its-drone-delivery-debut/>

<sup>29</sup>

[https://www.researchgate.net/publication/332249057\\_Impact\\_of\\_drone\\_delivery\\_on\\_sustainability\\_and\\_cost\\_Realizing\\_the\\_UAV\\_potential\\_through\\_vehicle\\_routing\\_optimization](https://www.researchgate.net/publication/332249057_Impact_of_drone_delivery_on_sustainability_and_cost_Realizing_the_UAV_potential_through_vehicle_routing_optimization)

<sup>30</sup> <https://www.woolworths.com.au/shop/discover/about-us/scan-and-go>

- RFID and EAS technology improves stock-on-hand data at all points of the supply chain, with optimised inventory management leading to lower out-of-stocks and increased product availability<sup>31</sup>
- AI-powered, temperature-controlled robotic collection hubs enable 24/7 click-and-collect pickups<sup>32</sup>. This will be the natural progression from existing collection lockers seen in Australian retailers today
- Autonomous vehicles have positive impacts on productivity, operating costs, safety, and sustainability<sup>33</sup>. With Australia boasting more active autonomous trucks than any country in the world<sup>34</sup> (largely due to the mining and military sectors), it is only a matter of time before the technology is pervasive in retail

The merits of the aforementioned technologies on all parts of the supply chain are abundantly clear. They will be supplemented by the growth of advanced data analytics which elucidate insightful consumer behaviour trends. Dubbed the Internet of Behaviours<sup>35</sup>, this will enable retailers to know exactly which prong of their multifaceted supply chain to utilise for specific customer segments.

It is clear that retailers cannot abstain from incorporating any individual fulfilment model from their holistic strategy. As the insatiable appetite for convenience grows, the innovations that supplement all components of retailers' omnichannel fulfilment models will be essential for future success.

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<sup>31</sup> <https://www.bizdata.com.au/blogpost.php?p=how-iot-and-ai-are-changing-retail-part-2>

<sup>32</sup> <https://cleveron.com/news/cleveron-launches-the-world-s-first-grocery-robot-with-two-temperature-zones>

<sup>33</sup> <https://css.umich.edu/factsheets/autonomous-vehicles-factsheet>

<sup>34</sup> <https://www.mining-technology.com/features/australia-leads-the-way-in-autonomous-truck-use/>

<sup>35</sup> <https://www.sciencedirect.com/science/article/pii/S2666351121000437>

## Conclusion

From Pryce-Jones to Bezos, from Llanllwchaiarn to Silicon Valley, and from next-day textiles to 10-minute ice cream delivery, the fulfilment of retailing globally has never stopped evolving.

The meaning of convenience has changed, and the once-elusive nirvana of immediacy is in sight.

No independent fulfilment model is enough to succeed. Retailers must leverage existing store networks, fully automated fulfilment centres, MFCs, and new technologies as part of a broad, balanced, and agile supply chain.

In the enduring war for market share, the currency is convenience, and an omnichannel fulfilment strategy is the only way it can be obtained.

Retailers will be left behind if they dare settle for anything less.