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# E-GROCERY INFRASTRUCTURE 2022

CENTRAL & MICRO FULFILMENT CENTRES | IN-STORE PICKING & TECHNOLOGIES | JUNE 2022



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**SEPTEMBER 19-22, 2022  
MANDALAY BAY, LAS VEGAS**



# EXEC SUMMARY: 2022 E-GROCERY INFRASTRUCTURE REPORT, FROM CENTRAL TO MICRO FULFILMENT, IN-STORE AND LAST MILE TECHNOLOGY

## + [positives]

- Multiple publicly traded grocers increasing Capex for online & digitalisation initiatives
- Non-Legacy Grocers very active buyers of material handling automation equipment
- Increased traction for e-Grocery Platforms and headless architecture is now preferred option
- Early MFC adopters continuing deployments
- The first multi-grocer locker delivery network

## +/- [neutral]

- Multiple material handling system integrators have hired Snr automation people from grocers; e-Grocery viewed as the next big trend after e-Commerce
- MFCs no longer viewed as a silver bullet, network approach from top warehouse automation vendors
- Multiple new vendors; Legacy vendors have released products & services overlapping with e-Grocery

## - [negatives]

- Online grocery sales declining from pandemic highs; Declines at different speeds and likely influenced by geopolitical events & surging inflation
- The partnering trend between MFC + e-Grocery Platform vendors has cooled/died
- New MFC customer deployments quiet since the 2021 e-Grocery Infrastructure report

## GROCERY SECTOR EXTREMELY COMPLEX

- STIQ acknowledges that the grocery sector is extremely complex with often short or immediate supply chains from farms to stores, often difficult to replicate
- Many pureplay online grocers have partnered with Legacy Grocers for ready-made supply chains
- Online grocery sales remain at <10% as a proportion of all grocery sales in many countries, even strong online countries, such as the UK

## POST PANDEMIC IMPACT, INFLATION

- Many publicly traded grocers have announced expanded Capex on digital & online initiatives and STIQs view is inflation will not affect the sector in the short term
- However, there may be continued supply chain challenges for robotics and other automation equipment
- Pandemic effects are subsiding fast and it is difficult to estimate any permanent positive effects on sales
- Furthermore, post-pandemic inflation caused by geopolitical events, QE, etc. is currently impacting consumer behaviour

## CLEAR DIFFERENCES IN 2022 INTERVIEWS

- STIQ noticed a number of clear differences from the 2021 report (download [here](#) for free)
- The main difference was the lack of new MFC deployments + a sense that Legacy Grocers (those with stores) are taking time to consider their approach to the online channel
- Part of this could also be that many grocers built up significant technical debt during the pandemic that they are now unravelling

## SIGNIFICANT EXPERIMENTATION

- Grocers are experimenting significantly across online grocery technologies and modalities
- For example, the very first shared (multi Legacy Grocer) last mile solution was unveiled in Paris in 2022

## NO SILVER BULLET

- Overwhelmingly, STIQs impression of 50+ interviews and conversations with industry participants is that the sector remains in its infancy despite PR initiatives by early adopters and technology vendors
- Significant hiring from grocers including such warehouse automation teams hints that vendors have some expectation of larger projects to come
- Whilst Legacy Grocers have been relatively slow to buy equipment, pureplay grocers have accelerated automation deployments to gain and retain market share

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# EXEC SUMMARY: E-GROCERY INFRASTRUCTURE TECHNOLOGIES COVERED IN THIS REPORT



## 2022 REPORT: CHANGES FROM 2021

- Changes from e-Grocery Infrastructure 2021 (download [here](#)):
  - Added: Journey to e-Grocery operations, In-store technologies, Autonomous Store, In-store Picking, Location Software, Delivery Routing Software,
  - Excluded: Last Mile Robots, Drones (covered in separate report, download [here](#))

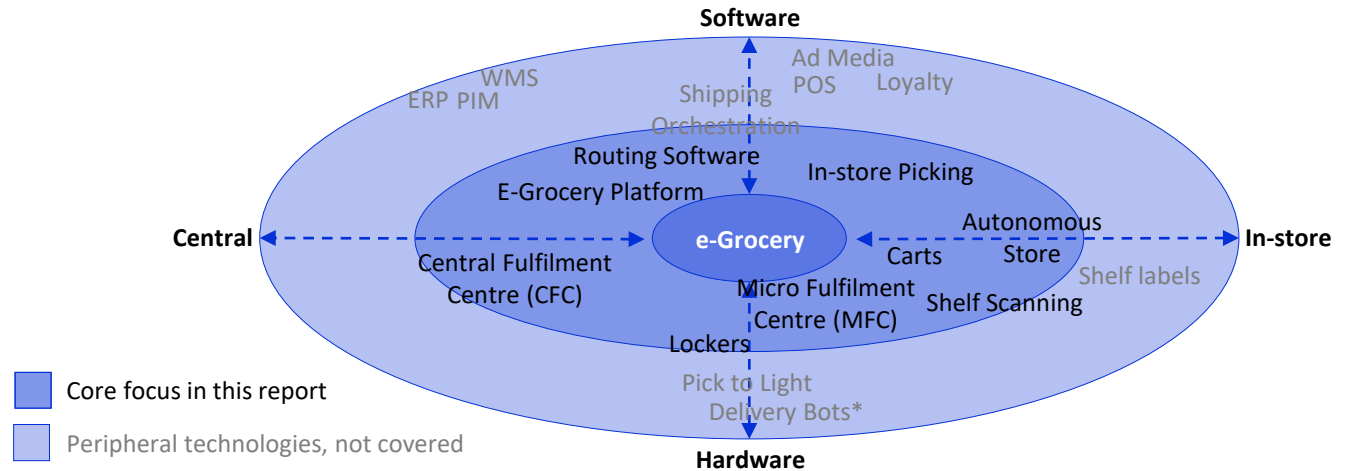
## 2022, IN-STORE FOCUS

- STIQ believes that the majority of online grocery orders today are picked & packed and delivered from stores
- The main problem with fulfilling from stores is inventory accuracy (location + quantity available)
- To fight the inventory problem, many grocers have spun up Dark Stores where customers are not allowed to pick from shelves
- However, Legacy Grocers (with stores) would like to leverage the existing store estate as far as possible and are known to experiment with new technologies

## THE EDGE OF E-GROCERY INFRASTRUCTURE

- STIQs definition of e-Grocery Infrastructure is broad and includes a wide variety of technologies and equipment
- Online grocery shopping remains nascent and grocers are experimenting with a wide variety of approaches, systems and solutions
- Pureplay online grocers are by definition fully digital and will buy selectively from mainly central capabilities
- Legacy Grocers have to leverage their often extensive store estates and may buy from both central and In-store capabilities

## E-GROCERY INFRASTRUCTURE TECHNOLOGIES COVERED IN THIS REPORT



Source: STIQ Research & Analysis

## ONLINE FORCING DIGITALISATION OF STORES

- Grocery supply chains are hugely complex and suppliers often have to pay for shelf space in addition to media coverage, such as advertising
- The emergence of online, fully digital operators have evidenced the potential for additional revenue streams for many Legacy Grocers
- Customer data is at the centre, and grocers are increasingly aware that online offers a very granular source of data compared to the very basic fidelity of in-store data
- STIQs view is that grocers are increasingly looking at how to digitise their stores to increase potential for increased customer data streams

## INCREASED VENDOR FRAGMENTATION

- The pandemic has forced many new & legacy vendors to showcase grocery specific products they may have aimed to release in a few years time
- “There's a lot of different approaches in the market right now. Some people are looking at fulfilment. Some people are looking at partnerships with 3<sup>rd</sup> parties. Others are looking at plugging in forecasting or supply chain software or web shop software. It's fair to say there's a lot of players in the market and it's a busier market than it's ever been since Covid. But that doesn't change the fundamental challenges of online grocery.” [Ocado Solutions]**

\* Covered in STIQs report on Last Mile Delivery Robots ([link](#))



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# CONSUMERS CAN BUY GROCERIES ONLINE FROM A WIDE VARIETY OF COMPANIES WITH DIFFERENT BUSINESS MODELS

## ONLINE GROCERY IS CROWDED

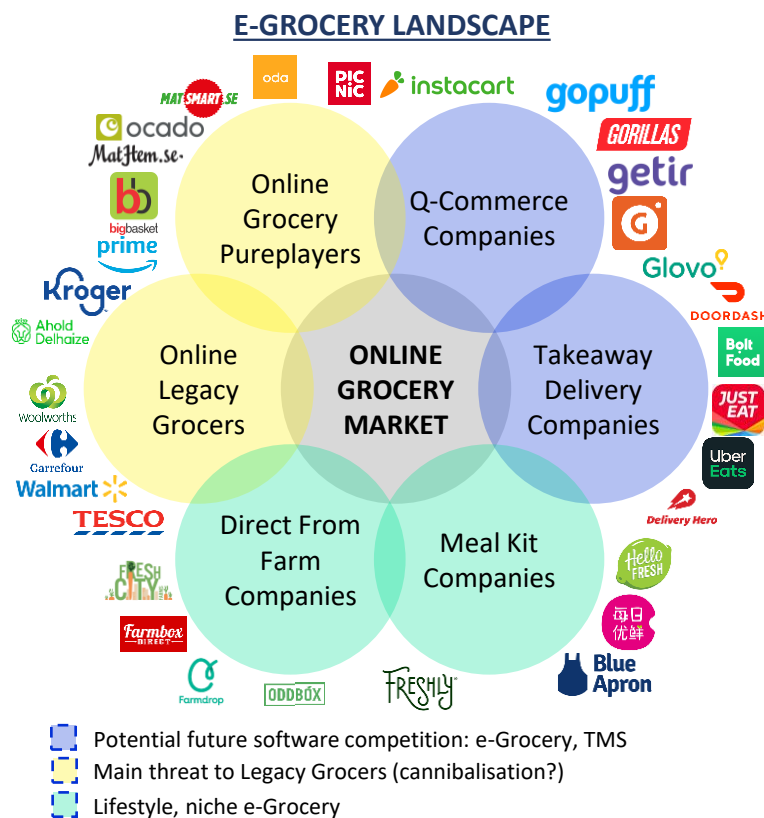
- Consumers can get groceries from a variety of different companies, often overlapping with ready-made, or take out, food deliveries
- STIQ highlighted six distinct e-Grocery channels, excluding food wholesalers and FMCG/CPG brands

## LEGACY GROCERS

- Legacy Grocers (those with stores) account for the vast majority of grocery retail sales
- Grocery margins are thin and Legacy Grocers have spent decades refining supply chains
- Larger grocers have also acquired food production plants and wholesale distributors, and introduced non-food categories to improve overall profitability
- IT systems have often evolved from fully manual & analogue processes with a focus on selling in stores
- Many Legacy Grocers operate significant property portfolios; the value of the property portfolio frequently influences strategic decisions
- Considerable regional variations exist between Legacy Grocers, even at a local level
- Online has historically presented a limited opportunity
- There is a wide range of Legacy Grocers, each with different online priorities and internal capabilities for managing online sales
- Larger grocers are often publicly traded which has also influenced decisions relating to e-Grocery Infrastructure

## ONLINE PUREPLAY GROCERS

- Most online pureplay grocers have partnered with Legacy Grocers to access a ready-made food supply chain



Source: STIQ Research & Analysis 2021, 2022

- Non-grocery categories represent a key opportunity to drive improved margins
- Many younger online pureplay grocers have exclusively manual or extensive manual pick & pack operations
- Some of the more established pureplay e-Grocers are increasingly deploying advanced fulfilment automation

## Q-COMMERCE COMPANIES (<1HR DELIVERY)

- The Quick-Commerce segment has been supercharged with large funding rounds, but many, if not all companies, remain unprofitable
- The main USP is rapid delivery of groceries, often <20min
- Business models and strategies continue to evolve as these companies mature
- Many Q-Commerce players operate property portfolios of Dark Stores located in city centers

## TAKEAWAY DELIVERY COMPANIES

- These companies have been forced to diversify into grocery delivery by the emergence of Q-Commerce players, but often struggle to match fast delivery times
- Takeaway delivery has matured as a business model and the money supply has switched from equity to debt adding complexity to grocery delivery strategies
- Many companies have resorted to partnering with Legacy Grocers and/or investing in Q-Commerce players

## MEAL KIT COMPANIES

- The Meal Kit segment matured in a short period of time and many companies are now chasing profitability; subscriptions form a key part of the business model
- Many of these companies continue to experience huge variations in weekly workload

## DIRECT FROM FARM COMPANIES

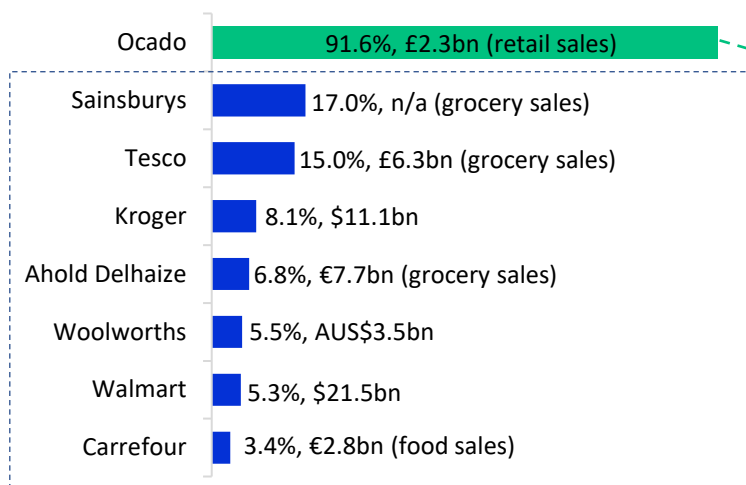
- These companies are mainly operating in fresh produce, such as vegetables and typically deliver boxes directly from farms or consolidated from farms at wholesalers
- This segment overlaps with ethical food solutions, such as ending food waste, etc.





# LEGACY GROCERS WITH AN ONLINE CHANNEL ARE MULTI- OR OMNI- CHANNEL OPERATORS. MOST OTHER GROCERS TEND TO BE ONLINE PUREPLAYERS

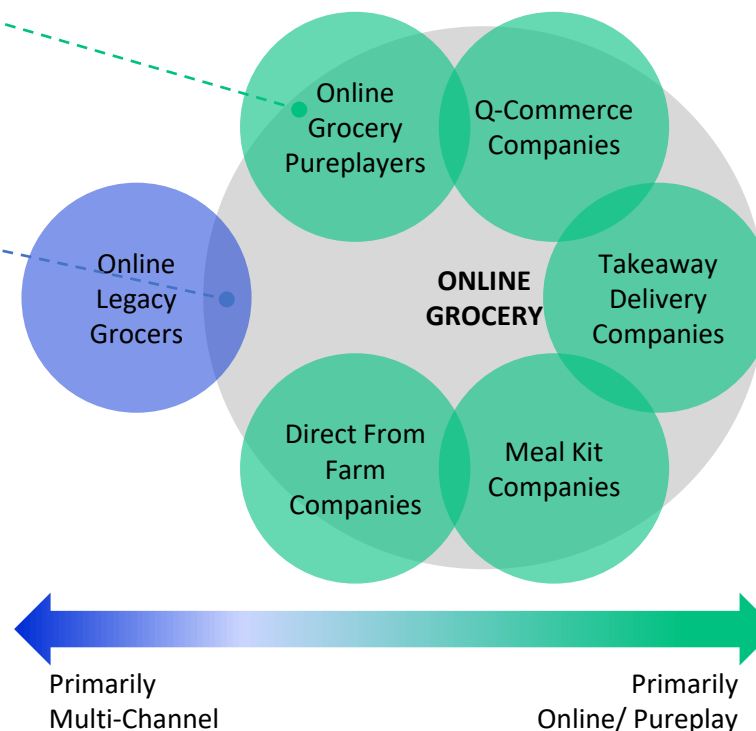
## ONLINE SHARE FOR PUBLICLY TRADED GROCERS



Key: % online share, Value (local FX), (online segment)

Source: STIQ Research & Analysis. Most recently published annual reports. Sales may include taxes/VAT. Grocers have different Year End periods and sales may include/exclude important lockdown periods.

## E-GROCERY LANDSCAPE (CHANNEL REPRESENTATION AS % SHARE OF OPERATIONS)



Source: STIQ Research & Analysis

- However, many of these “walk-ins” appeared to be more focused on adhering to local planning regulations than running anything similar to convenience stores ([source](#))
- GoPuff is one Q-Commerce player that could be argued to be a multi-channel retailer with multiple acquisitions of physical retailers ([source](#))

## ONLINE IN GROCERS ANNUAL REPORTS

- Few grocers give out online penetration, or when they do, they have tended to represent online as an opaque part of revenue
- For example, some grocers include online ticket sales, mobile phone subscriptions, travel sales, etc. and anything that is transacted online
- A few publicly listed Legacy Grocers have started segmenting online as a share of their grocery sales, but may not segment overall grocery revenue, etc.

## MULTI-CHANNEL PENETRATION

- Most non-Legacy Grocers operate at or very near 100% online whilst most Legacy Grocers operate at <10% penetration
- British grocers (Tesco, Sainsburys) were early adopters of online and have managed to drive penetration above 10% of their grocery sales
- Ocado is a pureplay retailer, but group results include Ocado Retail (online grocery sales) and Ocado Solutions (technology sales)

## MULTI-/OMNI-CHANNEL GROCERS

- Note that this report makes no difference between Multi- & Omni- Channel; Grocers appear to use the two meanings interchangeably
- The key difference between Legacy Grocers and other businesses competing for online grocery consumers is that Legacy Grocers operate vast property portfolios
- In recent years, a few pureplay grocers have begun operating from Dark Stores and some even offer walk-in collections, arguably a form of multi-channel





# EVERY LEGACY GROCER IS DIFFERENT, WITH MULTIPLE APPROACHES TO ASSETS, IT, CULTURE AND LAYOUTS

## DIFFERENT GROCERY BUSINESS MODELS

- The Legacy Grocer landscape is highly heterogenous, where each grocer operates in a different way with corporate structures evolved over decades and centuries
- This extends to different business models, such as Co-ops, franchises and membership-type organisations

**“In Germany, the two big ones, Rewe and Edeka, have a kind of association structure... not a centrally owned organization, but owned by the merchants. This makes stuff super complicated. These grocers are thinking about ok, what will the future be like? The future grocery user experience... Are there customer groups that don't need stores anymore? Even these corporations have changed their behaviour when it comes to online.” [Spryker]**

- Grocers’ business models can make the sales process more arduous and slow

**“We also closed some deals with a German grocer. Their organization is very decentralized and many stores are owned by an independent merchant. They have four preferred platform solutions within the group for online grocery. And in this case you go from retailer to retailer... so they are independent companies. It's a different kind of approach. And there you talk about in-store picking locally instead of any big warehouse automation.” [Emporix]**

**“Our first sale was in Eastern Europe and now we are talking about selling it to the headquarters in Western Europe. With the supermarkets usually... and you probably know, you do one thing in one country, but you almost have to sell again to a different company when you move within the same company to a different country. So yeah, this process is quite slow.” [Anonymous]**

- International grocers may operate different IT organisations that may be separated by country or partially dispersed across a number of core countries  
**“One of our customers has a hybrid IT division where some of the larger countries may have their in-country technology department which may also be in Group... whereas in the smaller countries they would have a localized IT set up and they would report into some of these global functions. I don't know how consistent across all their countries this is. I would say it's a kind of a central plus distributed model. It's fairly hybrid...” [FoodX]**
- Some grocers are also publicly traded  
**“Grocers that are publicly listed have different kinds of pressures to those that are family owned essentially. But, anyway, they're all quite lost and they do not have a very clear vision for how to do online grocery.” [Anonymous]**
- Where there are decentralised business models, such as franchises, operating online can be difficult for grocers to explain to franchisees or members  
**“Edeka’s online strategy was to become a shareholder in Picnic. Rewe invested in central warehouses in Berlin and Cologne in recent years, but still has a very tough time to explain this investments to their members in other parts of the country. Apart from Cologne and Berlin, they're still offering a pick from store solution, which is the worst thing you can do... because there are so many mistakes that are happening with such a structure.” [Spryker]**

## DIFFERENT LEVELS OF URGENCY

- Online pre-Covid was also frequently allowed to simmer internally as growth was slow

**“Some grocers with a bit of an e-Grocery operation that was not extremely evolved... These grocers preferred for various reasons that people go into the actual branches and buy physically. And in some countries like Germany, for instance, there was almost no option for ecom. Grocers that had e-Grocery had to be fit up. Those that didn't have it had to not even start with us, but start with putting together an e-Commerce function. And because they cannot just start delivery with an e-commerce platform, the whole infrastructure also had to support it... those that had a bit of an e-Commerce offering beefed it up and had to accommodate for much more volumes. Because demand for deliveries went through the roof, especially during the first few lockdowns. And they couldn't cope if you remember... the first lockdown that they would offer you a delivery time slot next month...” [Urbantz]**





# LEGACY GROCERS HAVE EVOLVED INTO A HETEROGENOUS GROUP OF COMPANIES, OFTEN WITH A SINGLE CHANNEL FOCUS

## DIFFERENT PROCESSES

- Differences in store management and processes have also led to particular behaviours in different countries and with different grocers
- Interviews suggested that planogram compliance is a key retail deficiency in the US market

**“US companies seem to be less disciplined on adhering to planograms.” [Anonymous]**

**“One of the biggest areas of inefficiency in the US grocery market is item location accuracy and planogram compliance. Planograms aren't updated and properly marked in store. The system tells pickers where to go to, the aisle or the shelf. It leads them to roughly the right area, but not exactly and they spend time looking around but the product isn't there because planograms moved or it wasn't updated. In the UK you don't actually have to look at the product, it's so accurate pickers don't even need to look. They go straight to the spot. They notice the product, they pick and scan and does the scanner make the right noise or not. And actually in the Nordics this is something that they do very well where stores are extremely well laid out.” [TPL]**

- These are differences across organisations, from how stores are supplied to how suppliers ship goods to grocers, etc.

## DIFFERENT SPACE AVAILABILITY

- Differences extended into space availability and store footprints, and at a generic level, store sizes in the US market tend to be larger than for European peers
- One consequence of greater space availability in the US market has been that the MFC appeared to have gained significantly better traction compared to Europe

**“In the US it's more feasible to deploy MFCs because we have a lot of these big supercentres and they can often take their remodelling budget and move things around a bit. As we get into Europe, there we have to be more flexible, sometimes it might be a shuttle system, sometimes it may be an AutoStore system. I'm hoping in the future it will be an AMR system for some of them as well. Just depending on what the online order volumes are, and what their store capabilities are.” [Dematic]**

**“There's existing buildings which are not the shop, but are existing buildings... and that's a big change for the financing side because if you put an MFC in an existing shed, you get to market at least a year earlier than having to build a new shed... and that's one of those things... The holy grail is to do it in the in the store building and that's going to happen much more in the US, than in Europe, in my mind due to the availability of store sizes in the US.” [Anonymous]**

**“MFCs are far more prevalent in the US at the moment than in the UK, or even in Europe.” [Anonymous]**

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# CONSUMER PREFERENCES FOR ONLINE GROCERY ALSO VARY ACROSS CONTINENTS AND COUNTRIES

## CONSUMER PREFERENCES VARY

- Consumer preferences differ across countries and cultures
- One example is delivery preferences
- For example, in France consumers preference is for out of home delivery, also known as drive-through collection

**“France is typically an out of home delivery country for online groceries.” [Colib]**

- Whilst home delivery is the leading delivery preference for e-Grocery in the UK, Latin America, Asia

**“Home deliveries accounted for 79% of online orders, with click & collect participation increasing from 11% at the start of the year to 25% by the end of the year.” [Tesco, 2021 AR, p22]**

**“Delivery is key in Latin America. The market is 90% delivery and there's a tiny bit of click & collect, curbside. On the delivery side we see a mix of retailers that have in-house fleets with their own drivers. They very often have dedicated 3PL fleets, so fleets that work only for them in certain stores. And then last milers that connect via API so the Stuart or DoorDash equivalents in each local market.” [Instaleap]**

- And in the US, curbside delivery was the primary consumer delivery preference

**“The US is a pickup dominant market. Even in the largest metro markets it's that way. This is Curbside pickup.” [Brick Meets Click]**

## DIFFERENT PREFERENCES, CHALLENGES

- Various consumer preferences have created issues unique to specific countries

## ONLINE GROCERY DELIVERY PREFERENCES



Source: STIQ Research & Analysis

**“In North America there is a lot of talk about weekend pick up times. Saturday and Sunday are two huge days for grocery pickup. They're big spikes for everybody. So how do I make more of those pick-up times available to people at 1-2 in the afternoon on those two days. And then how do I service throughout the rest of the week?” [Dematic]**

- The US was relatively late to online grocery and the delivery model remained in a state of flux
- “Large Capex investments in fulfilment tend to push the delivery orientation. US may have been a delivery first market and that's how most retailers went online via 3<sup>rd</sup> party providers like Instacart and Shipt. Conventional grocers in the US have a bias towards delivery... But if you look at mass, meaning Walmart and Target, it's the inverse... they're pickup dominant models, significantly different, maybe by up to 30 percentage points if you look at order share mix.” [Brick Meets Click]**

- Once customers have become accustomed to one preference, it may be difficult to wean them off or start charging for previously free options

**“There's a big difference in grocery lockers between US and Europe. In Europe retailers are going for online grocery strategy. We have several customers who are using our robot locker and some of them already use different type lockers from different companies... But in the US... it will be interesting to see what happens because during Covid they started to offer curbside pickup. You drive up, just open your trunk and everything gets put in and then you drive away. It's very labor intensive, but it's also very convenient for consumers. It will be interesting to see how US grocers are solving curbside pickup.” [Cleveron]**

## AND WHAT WORKS IN ONE COUNTRY...

- Interviews highlighted that what works in one country may not necessarily work in other countries
- “Everybody is looking to the UK because the online grocery share is so much higher there. This reminds me of the time before the iPhone when everyone was looking at Japan and i-mode. This was way more advanced than the Nokia B&W phones. Then everyone pointed to Japan as the future... and then the iPhone came out.” [Spryker]**



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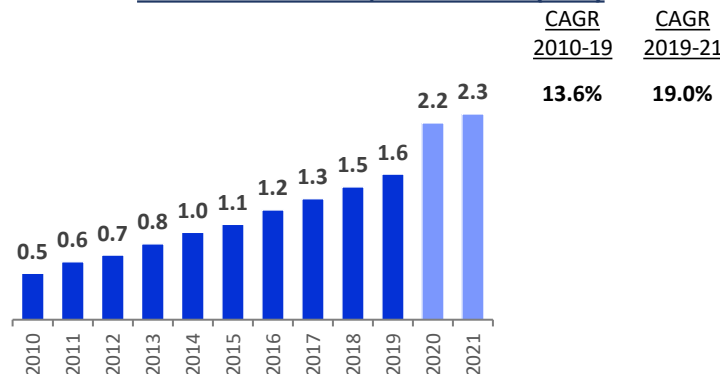
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# GLACIAL PRE-PANDEMIC ONLINE GROCERY GROWTH. MULTIPLE NEW ONLINE GROCERY BUSINESS MODELS LAUNCHED

OCADO REVENUE, 2010-2021 (£bn)



Source: Ocado annual reports

## GLACIAL PRE PANDEMIC GROWTH

- The pre-pandemic online grocery market was considered a limited opportunity with glacial growth
- For example, leading early pureplay adopters, such as Ocado, increased retail sales at <14% CAGR 2010-2019
- **“Online grocery in Europe, apart from the UK, was not a big thing in 2014 when we started. Until the pandemic the discussion was always ok, how fast will the market change in Germany? We were talking about 2% points of the overall market.” [Spryker]**
- Despite an apparent wider adoption of online grocery in the mid 2010’s, low growth rates continued to hold back R&D spend in the e-Grocery Infrastructure space

SELECTED E-GROCERY COMPANY FOUNDATIONS & EVENTS, 2010-2022



Source: STIQ Ltd research & analysis

**“I think it was in 2015 when we engaged the very first grocery customer for Salesforce. Following that, we had a few more in various geographies, but the engagements were very similar... Starting with, ok we do some e-commerce... We mainly worked with grocers who already had something online. We considered them mature because they understood the operational challenges and difficulties when you start selling online... And they wanted to improve or take the next step or benefit more from the technology and they saw potential. This happened before the pandemic.” [OSF Digital]**

- However, despite increasing interest from grocers, low online grocery penetration rates persisted
- **“In 2018, e-Grocery sales in the US were small. It was in the 3% range. It was a money losing proposition for the grocers. They knew it. They were having their own website and technology because they felt it was a long term investment but it wasn't a business that anybody was excited about growing.” [Wynshop]**

## DISGUISED GROWTH, LIMITING ONLINE SHIFT

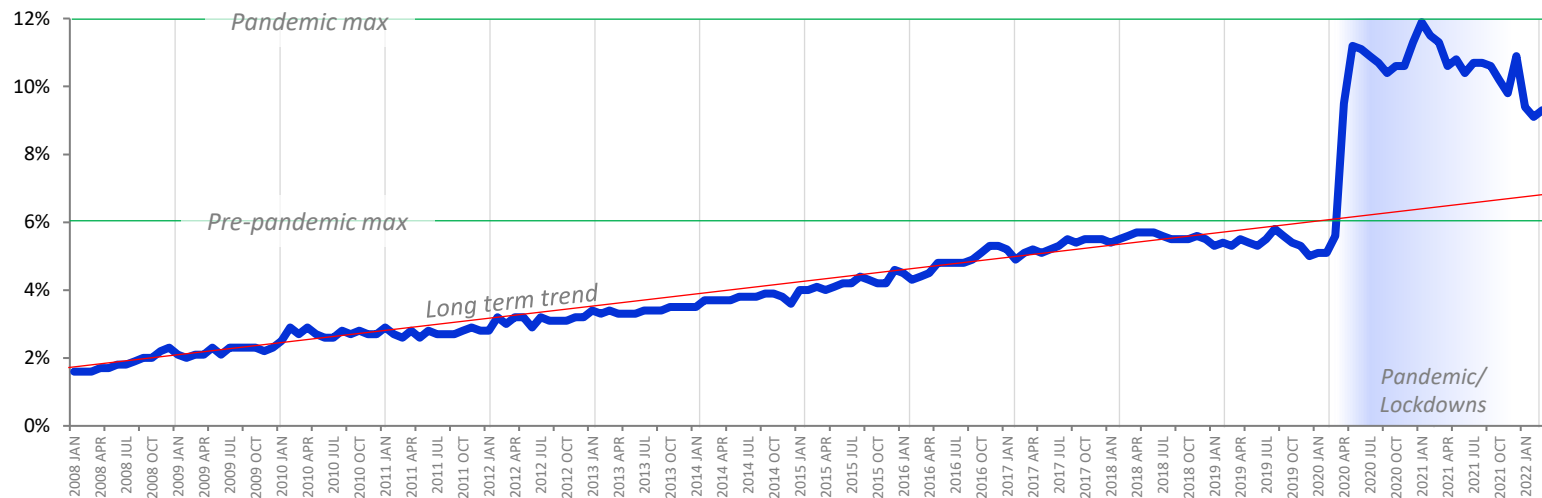
- Interviews for this report suggested that all grocers have managed to grow and seemingly low growth rates may have been disguised in changing consumer behaviour
- **“Where Picnic has been active for 2-3 years you might expect that store grocers market share shrunk because Picnic is so strong... but grocery is growing so strong because of a consumer behaviour shift. More organic food, more local foods... higher values. It’s also getting harder for grocers to get the workforce, and even with a very modest growth of 2-3% for the traditional channels, it is still hard to manage. So the whole online part comes on top... so there was no real shift. Obviously the market was growing fast enough for everybody, and I expect this will continue regardless of the recent inflation issues.” [Spryker]**
- Seasonal fluctuations and promotional activities may also impact data
- **“There's so many seasonal fluctuations that it can be difficult to say what's happening. We've also seen grocers experiment with pick up & delivery fees which impacts sales.” [Wynshop]**





# THE PANDEMIC SUPERCHARGED ONLINE GROWTH IN THE SECTOR

**MONTHLY PROPORTION OF INTERNET CHANNEL GROCERY IN THE UK, JAN 2008-APR 2022 (%)**



Source: ONS. Note that this chart is specific to the UK market

## E-GROCERY MARKET SIZE METHODOLOGY

- Few grocers provide clear online sales data and most market research outlets only provide estimates
- ONS in the UK provides relatively accurate numbers for “internet channel sales” in the grocery retail sector
- Readers should note that the UK market is relatively mature compared to many other markets and is mainly a delivery market
- Other markets have different dynamics and may have grown differently
- Furthermore, all larger players in the UK market ran out of capacity/delivery slots during initial lockdown periods and this may have limited top line growth

## SLOW PRE-PANDEMIC GROWTH

- Online grocery experienced glacial pre-pandemic growth and even appeared to flatline between 2H18 and 4Q19
- Internet penetration increased from 1.6% share of all grocery to 5.8% between Jan 2008 and Aug 2019

## PANDEMIC DOUBLING OF ONLINE GROCERY

- The first pandemic lockdown caused UK online grocery to increase from 5.1% in March 2020 to 9.5% in April 2020
- Whilst leading multi-channel grocers in the UK closed in on 20% online share of grocery sales, the overall market peaked at 11.9% in Jan 2021

## THE PANDEMIC THAT CHANGED EVERYTHING

- The Pandemic’s influence on the growth in online grocery has been widely disseminated and STIQ interviewees concurred
- “We also see countries where there has been a relative reluctance to buy grocery online like Germany and it was almost at 0% before the pandemic... and most of the large supermarkets in Germany did not offer any kind of e-commerce option up until Covid... and then they all changed.” [Urbantz]
- Some grocers that were not already online, suddenly changed their views
- “But when the pandemic hit, the whole thinking among grocers changed. Now it was mainly driven by fear. I would say the trend changed to ok, what do I do if I have to close my stores? How can I bring the products to the customer... so it was not driven by long term ambitions.” [Spryker]
- However, Covid has also caused some issues in estimating the true market size

“The one thing that has changed the market has been Covid spikes. So when there's a Covid spike, it doesn't matter if it's Thanksgiving or Easter or Christmas. That's not a normal pattern.” [Wynshop]

## PANDEMIC IMPACT ON AI ALGORITHMS?

- On a separate note, STIQ also wonders to what extent the pandemic may have impacted various AI algorithms
- I.e. consumer shopping patterns were completely skewed during the pandemic with unnatural purchasing of 10 packs of flour and 20 packs of toilet paper
- Will grocers have to reset their buying behaviour AI algorithms to pre-pandemic??





# LEADING GROCERS EXPECTED PERMANENT EFFECTS FROM THE PANDEMIC UPLIFT

- The pandemic caused huge changes in the grocery industry that may continue to reverberate in the sector for years to come, not only positively

**“Chief executive Simon Roberts described the accelerated adoption of ecommerce during the pandemic as ‘one of the most significant things to happen to the industry for the past 20 years.’” [Sainsbury's via FT, [source](#)]**

- A key change was the huge acceleration in the proportion of online sales and the large number of new online customers

**“Digital sales’ two-year stacked growth was 113% for 2021 and has grown triple digits since the beginning of 2019.” [Kroger, AR 2021, p25]**

- Readers should note that annual figures for 2020 & 2021 may be a misleading indication of post-pandemic performance (depending on what 12 month period is included)

**“In response to the unprecedented increase in customer demand for online groceries, we rapidly expanded our online business, more than doubling capacity to 1.5 million slots per week over a five-week period. Sales grew by 77% in the year – an additional £2.8bn – taking annual sales to £6.3bn (inc VAT). Online sales participation doubled to 15% for the full year, reaching a peak of 18% during the fourth quarter... Our first UFC (urban fulfilment centre) opened in the year. Our second UFC is now due to open May 2021, having been delayed several months by the pandemic, and a further four sites are due to open within the next 12 months. These UFCs will enable us to provide access to more delivery slots for customers with an increased rate of picking – a scalable, efficient option to fulfil ongoing online demand.” [Tesco, 2021 AR, p22]**

**“We have invested in Groceries Online this year to support its outstanding growth through unprecedented customer demand for home delivery and Click & Collect. We have grown sales by 120 per cent and we are now able to fulfil more than 850,000 online orders a week. We have gained significant market share in the year to become the UK’s second largest online grocery retailer. 17 per cent of our grocery sales are now online, compared with eight per cent in 2019/20.” [Sainsbury’s, AR 2021, p12]**

- Grocers responded to the pandemic valiantly with increased delivery slots

**“[US]Online sales were €3,228 million, up by 68.9% compared to the prior year at constant exchange rates. On a comparable 52-week basis, online sales grew by 73.7% in 2021... The increase versus last year was primarily driven by the pandemic, as consumers’ intent to shop online continued to increase. The launch of 270 additional click-and-collect points helped the brands capture sales from this channel, along with a further strengthening of partnerships with third-party delivery services, the acquisition of the FreshDirect online grocery delivery service and the expansion of ecommerce offerings across the U.S. brands.” [Ahold Delhaize, p111, AR 2021]**

## **SOME GROCERS EXPECT LASTING EFFECTS**

- Publicly traded grocers believed a proportion of the pandemic-infused increase in online grocery proportion would remain post-pandemic
- This was mainly based on a permanent change in consumer behaviour, home working and that more “new to online” consumers had now tested online and liked it

**“COVID-19 is having lasting effects on consumer behavior, favoring more food-at-home consumption and increased online food penetration in comparison to pre-COVID-19 trends. Our omnichannel platform has played particularly well in this environment, enabling sales to grow in 2021 on top of an elevated 2020 sales base. Given the strong levels of reinvestment we are making back into our business and omnichannel offerings, we forecast continued sales growth in 2022 and the years following. Our guidance calls for an incremental €10 billion of Group net sales through 2025 versus 2022, driven by our digital and online investments, the leveraging of our Benelux food/non-food ecosystem, and continued store remodeling activity.” [Ahold Delhaize, p119, 2021 AR]**

## **A DECLINE TO BE EXPECTED**

- However, a decline may be expected after a huge upswing; for example, Kroger in the US, experienced a 3% decline in 2021

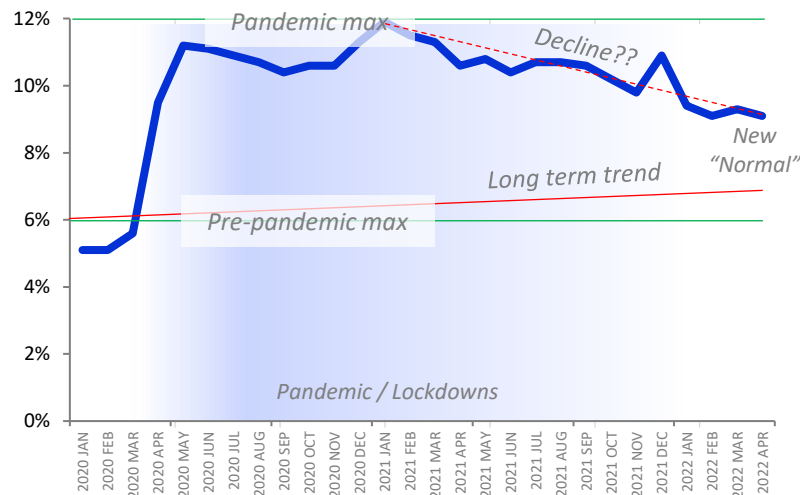
**“Digital sales decreased approximately 3% in 2021 and grew approximately 116% in 2020 and 29% in 2019. The change in results for 2021 compared to 2020 is primarily due to cycling COVID-19 trends. While digital sales decreased 3% during 2021, almost all customers who reduced their online spend during the year continued to shop with us in store...” [Kroger, 2021 AR, p32]**





# THE POST-PANDEMIC DECLINE MAY PROVIDE SOME BREATHING SPACE FOR GROCERS, BUT CONSUMERS MAY HAVE LEARNED WHAT GOOD SERVICE SHOULD BE LIKE

## POST-PANDEMIC GROWTH (UK)



Source: ONS. Note that this chart is specific to the UK market

## THROUGH THE INFLECTION POINT

- The interview consensus pointed to a post-Pandemic decline in online grocery penetration but also that it remained at elevated levels versus pre-pandemic figures **“It’s reasonable to say we have gone through an inflection point in the pandemic. Have we seen a kind of drop off in the shape, size of customer baskets? Yes. But people are still coming to the channel... and if you look at most of the big consumer surveys, the sense of the kind of growth and trajectory in the channel is there.” [Ocado Solutions]** **“Online grocery sales in the US remains elevated. According to some data sources it remains at around 4X higher versus pre-Covid sales.” [Mercatus]**

## THE NEW NORMAL MAY NOT BE EASIER

- However, a decline may not be all bad and appeared to have allowed grocers pause to rethink their approach **“The e-Grocery market has shrunk in the UK and in the US, so that immediate pain has eased a bit for grocers. I think they are taking more time and what I guess they are doing is looking into their supply chains and really looking at the overall network, how to set it up in a better structured way instead of rushing and putting automation into the next store.” [TGW]**
- The pandemic showed consumers what good service may look like and also brought out more e-Grocery Infrastructure vendors **“During Covid there was obviously a massive increase in demand at the beginning. I think now what's happened is there have been players bringing lots of new offerings to the market... but at a time when customers are coming out of Covid and have an extremely high bar for what a really good customer proposition looks like in grocery. A lot more people using the channel, so inevitably the bar has been raised and then in a kind of new normal environment where there's plenty of capacity around, people are in a position to shop around for a really, really solid customer proposition.” [Anonymous]**
- Interviews suggested there were more e-Grocery Infrastructure vendors in the market **“There's a lot more competition in the market, people offering different kinds of propositions, different kinds of services, different customer missions... there's a lot more people in the space.” [Anonymous]**

- Some grocers may simply be forced to rethink their options as consumers may want to continue with options provided during pandemic lockdowns **“The pandemic forced grocers to change. But now they're forced to really change because their shopper customers want to continue with these options.” [Local Express]**
- Interviews suggested that FOMO may remain as a driver for the online channel **“I'm getting mixed feedback from grocers. Some are still driven by fear. I assume that many grocers are looking at Gorillas' PR challenges right now and thinking they're glad it's not them. But at the same time Flink is doing very good business. Grocers in Germany and Austria have very thin margins... and you have to come up with a really scalable approach to get things going. Rewe has been in the market 10 years and are still losing money with their online grocery business. Many grocers still give me the feedback that they see tremendous potential. They know that this change is going to happen. There's still a question about how fast and how far this change is going to go...” [Spryker]**
- Some grocers remain offline, either by choice or because they were unable to get online during the pandemic **“As the pandemic is waning, there's some segments that are still catching up and trying to, believe it or not at this stage, get online and add and provide delivery solutions and so on.” [Local Express]**





# E-GROCERY INFRASTRUCTURE VENDORS VERY POSITIVE ON THE IMMEDIATE FUTURE (BUT ARE ALSO BIASED)

## VERY POSITIVE POST PANDEMIC INDICATIONS

- Whilst STIQ always treat vendor market interest responses as biased, there appeared to be strong traction in the market
- Vendor interviews suggested sharply increased levels of interest from the grocery sector (since STIQ published the 2021 report, available [here](#))

**“We have 3 core industries; fashion, grocery, and industrial & consumer. The impact of the pandemic has seen increased interest from the grocery sector.” [TGW]**

- Interest was a combination of actual signed business to accelerated conversations and an increasing pipeline

**“The last 12 months, coming out of the pandemic, it's been a year of accelerated conversations with a lot of grocery retailers. We're also noticing a lot of re-platforming going on. Tier 3 grocers, regional metro retailers, niche grocery retailers... They have recognized they compete best when they double down on the customer service and having a platform that can help them sell.” [Mercatus]**

- Nearly every pureplay online grocery business model was actively sourcing automation equipment

**“We're seeing a lot of traction around the meal kitting space as well. This is a very manual process at the moment. I mean some of these players have invested in new automated warehouses in recent years. I know many of them are looking at robotics for different things, sometimes just loading the boxes and then others the kitting process of obviously picking all of the individual items, which is something that can be done very fast by human, but is very labor intensive. You can probably pick tomatoes quickly, box faster than a robot, but do you want to just pick tomatoes 8 hours a day three shifts this week...” [Covariant]**

- Others indicated interest was across online grocery business models, from Legacy Grocers to pureplay  
**“So we are seeing everybody now, after the pandemic, showing interest... everybody that has to do anything with grocery and even the sort of related verticals like food boxes... but I'm talking about HelloFresh and these kinds of people are also experiencing a huge exponential growth in the last few years. Grocery has been at the heart of what we do from day one.” [Urbantz]**

- Ocado highlighted their 2 new partners in the last 12 months as a sign of a rejuvenated market

**“We signed on 2 new partners in the last 12 months. Obviously, Covid was a challenging time with a lot of travel restrictions and that obviously made it difficult to get out and about around the world. But we signed on 2 new partners and continue to have plenty of conversations around the world with different players as well.” [Ocado Solutions]**

## HOWEVER, ALSO SOME FRUSTRATION

- Some vendors quietly expressed a level of disappointment or frustration with the number of grocery businesses aiming to bring online activities in-house

**“To be fully honest with you... in all transparency talking about the grocery business. It's disappointing, it's really disappointing that more grocers are not investing in their own online capabilities. I don't know what the reason is, but perhaps they are scared... or perhaps that they are just too busy with other stuff.” [Anonymous]**





# PUBLIC GROCERS HAVE INDICATED INCREASED CAPEX SPENDING ACROSS ONLINE INITIATIVES BODING WELL FOR THE E-GROCERY INFRASTRUCTURE SECTOR

## INCREASED CAPEX FOR DIGITAL EXPERIENCES

- Grocers across business models indicated an increased appetite to invest

**“In 2020, Gousto’s net revenue more than doubled year on year to £189m, and EBITDA margin was 10%. However, Gousto today caters for fewer than 0.2% of UK evening meals consumed, so this is just the beginning. In 2021 and beyond we will continue to reinvest the cash we generate for the long-term; with the aim of increasing our grocery market share well beyond what it is today.” [Gousto, AR, 2020, p5]**

- And Legacy Grocers capital expenditure was increasingly aimed at improving multi-/omni channel and the overall digital consumer experience, and less on new stores

**“Our strategy includes improving our customer-facing initiatives in stores and clubs and creating a seamless omni-channel experience for our customers. As such, we are allocating more capital to eCommerce, technology, supply chain, and store remodels and less to new store and club openings.” [Walmart, AR, 2021, p38]**

**“We anticipate 2022 net capital expenditures of €2.5 billion versus €2.3 billion in 2021, with increased investments into our digital and online capabilities, as well as our healthy and sustainable initiatives. Over the next four years, we will maintain strong levels of reinvestment back into our businesses, with net capital expenditures expected to average 3.5% of sales.” [Ahold Delhaize, p120, AR 2021]**

**“Our capital expenditure for the year was £1,015m, £88m higher year-on-year, primarily due to higher maintenance spend in our UK stores and technology, including our investment in online capacity.” [Tesco, AR 2021, p24]**

## PROFITABLE ONLINE OPERATIONS IN FOCUS

- The profitability of selling groceries online has been a constant focus and public Legacy Grocers are aware they have work to do with improving online profit margins

**“A key component of our growth plan is to double digital sales and our digital profitability rate by 2023.” [Kroger, AR 2021, p24]**

**“We plan on improving online profit margins in 2022, as part of our ambition to make e-commerce profitable on a fully allocated channel basis by 2025. In Q4 2021, The GIANT Company opened a new e-commerce fulfilment center in the Philadelphia market as part of our brands’ initiatives to drive growth and efficiencies in online operations.” [Ahold Delhaize, p119, AR 2021]**

- Some grocers indicated their online activities may already be profitable

**“Our Groceries Online business is increasingly profitable as we benefit from our in-store pick model and Click & Collect. We have more than doubled our capacity over the last year and we are now the second largest online grocery retailer by market share.” [Sainsbury’s, AR 2021, p10]**

- However, readers should note that profitability may mean many different things and that grocers may account for online in various different ways

## BACK TO CHARGING FOR COST OF SERVING?

- As growth slows up, perhaps some of the pre-pandemic behaviour will return, such as charging for delivery and increased cost of acquiring new customers

- A few markets with some level of normality had re-instated delivery costs, suspended as part of Covid

**“In Estonia life is coming back to normal with no masks. Daytime delivery is back to... say €7.00 per order. This means more people walking to stores and buying their stuff. This definitely changes market dynamics. During Covid online competition was so tough in Estonia that the groceries compensated delivery fees. These fees are now returning to normal.” [Cleveron]**

- ... whilst delivery fees were viewed as one of the biggest driver of online growth

**“Lower delivery fees is the biggest driver of online grocery demand.” [TPG]**

## RETAINING CONSUMERS MAY MEAN CHANGE

- Some observers jumped on the barriers for further growth in e-Grocery as a potential reason for a lack of faster growth and declining penetration

**“I think we’re seeing a big drop off in e-commerce usage within grocery and it’s going back to pre-pandemic levels of growth. My view is that it’s really hard to retain online customers when it’s such a different... almost alien way of shopping. I genuinely believe the next thing that needs to shift on this is the UX and the usability for shoppers. If we can fix that and solve that, that’s going to make things a whole lot easier to start seeing that growth again.” [VST]**





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**SEPTEMBER 19-22, 2022  
MANDALAY BAY, LAS VEGAS**

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# ONLINE PRESENTS A TOUGH CHOICE FOR LEGACY GROCERS: CANNIBALISE YOUR STORES OR LET YOUR COMPETITORS DO IT FOR YOU

## ONLINE & INEVITABLE CANNIBALISATION

- Most grocers that go online do so with the knowledge that they will cannibalise their store sales and incur additional costs for doing so
- However, not going online may simply lead to an inevitable long term decline as a share of consumers are likely to want to order online from a grocer

**“Once you have stores and as soon as you set up a dedicated fulfilment centre, the reality is you're going to shift a significant chunk of your store sales to your online channel. If you take sales away from your store and put it to direct to cover the costs of a dedicated fulfilment centre... otherwise known as a double running cost centre, then you are deleveraging the fixed costs of your stores. This is the elephant in the grocery room that adding dedicated fulfilment centres... basically undermines the store profit model... and it gets worse over time.” [TPG]**

- The fixed costs of stores may sometimes limit how adventurous grocers are with the online channel and may also influence equipment choices

## SAMPLE GROCER “IMAGINED CUSTOMER INTENTIONS”



Source: STIQ interviews, research and estimates

**“Grocers are often not modelling at the enterprise level... They have to make assumptions about cannibalization or what that does to their operating cash flows out of their stores. You can't keep stores running if you're not generating self service sales revenues to cover the fixed costs... it's a relatively leveraged business model. A lot of costs are fixed with relatively low variable costs because customers do the work. If customers stop coming in to your stores and doing the work, you still have the fixed costs of keeping the store staff, rent and real estate taxes and all of that. Grocers are cannibalizing their own sales in that store.” [Alert Innovation]**

## ONLINE AS AN EXPANSION TOOL

- The online channel can also be used as an expansion tool for Legacy Grocers
- However, there may be questions if any gains will be permanent or temporary once the competition moves online

**“Initially, if you're the only one out there, you're being really aggressive in your existing market, like Tesco was 15 years ago you may get load of incremental custom and you will be building additional share. But then the competitors fight back more aggressively and to keep their high spending channel customers. And suddenly your incrementality goes down and suddenly you're deleveraging massively your existing stores.” [TPG]**

- For an example, see Kroger's expansion into Florida ([source](#)) where they did not have a single store
- However, this can be a highly risky endeavour with an unknown outcome

**“Until retailers feel comfortable with investing into a proper dark store solution, for instance, where they can capture a separate market... because I think the problem with in-store retail in e-Grocery is that you sort of capture the same market twice... a customer who just can't be bothered to go to the shop...” [FoodX]**



# THE JOURNEY FROM OFF TO ONLINE INCLUDES VARIOUS STAGES OF COMPLEXITY FOR LEGACY GROCERS

## THE ONLINE GROCERY JOURNEY

- Every grocer approaches their online journey differently with different infrastructure, aspirations and varying degrees of commitment
- The e-Grocery Infrastructure sector offers plenty of options for grocers to add online capabilities
- These options vary from e-Grocery Light to a completely separate channel, or to operate as a pureplay online grocer

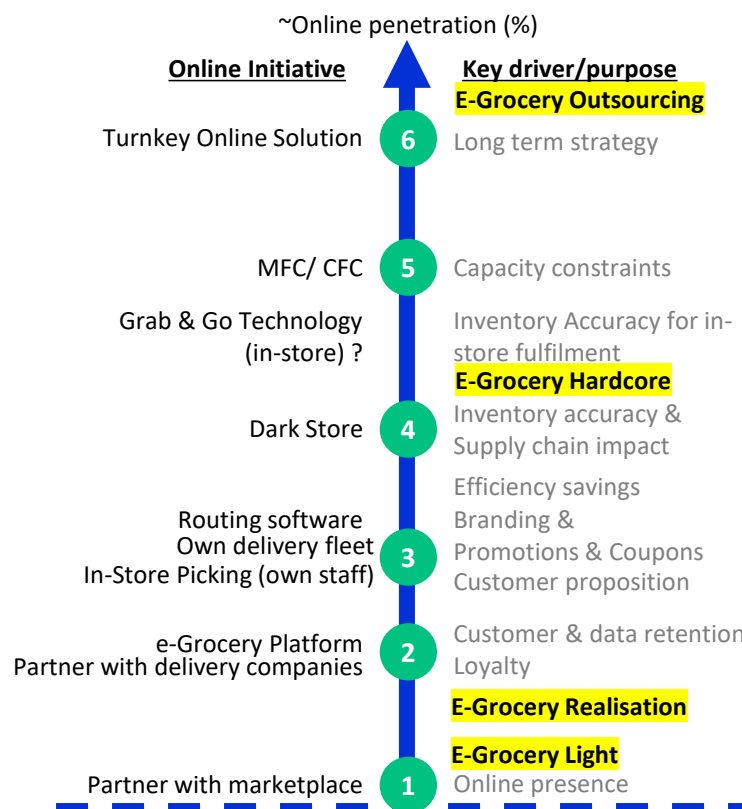
### 1. E-GROCERY LIGHT/ THE PARTNERSHIP

- Many Legacy Grocers may start their first online experience with marketplace platforms, such as Instacart or Snappy Shopper
- Advantages of this include a quick set-up with limited organisational changes & up front costs for grocers
- Disadvantages include that it is difficult to know who is shopping, data visibility is very limited

### 2. THE E-GROCERY PLATFORM

- Getting to stage 2 may be via stage 1 or pre-pandemic attempts at an online presence
- Grocers may have attempted developing their own platform or modifying a general merchandise e-Commerce platform
- Typically grocers at this stage are increasingly aware of the complexity of operating online and fulfilling from their own stores
- This stage requires organisational transformation and change management that may take years to complete for larger enterprises including multi-/cross departmental work

## SIMPLIFIED STAGES IN THE E-GROCERY JOURNEY



Source: STIQ Ltd Research & Analysis

### 3. EARLY E-GROCERY EVOLUTION

- Having fulfilled an increasing volume or orders internally a grocer may need to rethink their customer proposition and overall customers & brand experience
- Further efficiency savings can be gained from higher volumes and customer densities

## 4. MATURE E-GROCERY EVOLUTION

- Fulfilling increasing volumes from stores may now frequently lead to stock outs with substitutions and potential returns or rejections by customers
- Dark stores may be viewed as a solution to avoid substitutes and to gain further efficiencies
- Technology-led grocers may start early considerations of adding warehouse automation (MFCs)

### 5. E-GROCERY AUTOMATION

- Capacity constraints of dark stores and/or store picking means automation is required to meet the customer propositions
- Running duplicate inventories in separate buildings such as a Dark Store and a normal store may no longer make sense

### 6. SEPARATION OF CHANNELS

- Some grocers have come to the conclusion that the best way forward for them is to largely or completely outsource their online operations and may partner with a turnkey online solution vendor
- A few grocers may jump from stage 1 to 6
- Grocers that evolve in every stage from 1 through to 5 are more likely to operate as true Omni-channel retailers compared to grocers that may bypass and in-source a turnkey solution
- Both approaches are valid





# A WALL OF COMPLEXITY WHEN LEGACY GROCERS LOOK TO TAKE MORE RESPONSIBILITY FOR THEIR ONLINE ACTIVITIES

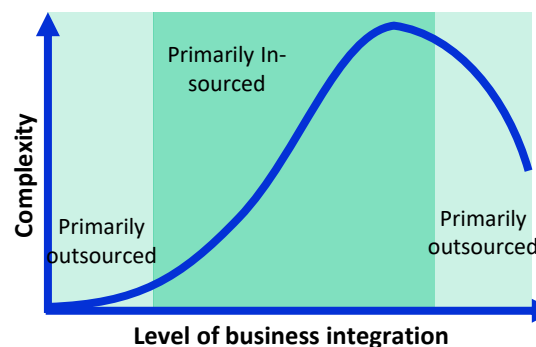
## IN- OR OUTSOURCING ONLINE GROCERY

- There are two states (along a grey scale) for managing online as a grocer; Primarily In- or Outsourced
- Outsourced involves two edge cases
  - Using a marketplace/s, such as Instacart with all operations external to the grocer
  - A complete turnkey solution, such as Ocado Solutions with all operations internal to the grocer, but often as a new division
- Insourced is when grocers take internal responsibility for its online operations
  - Building internal teams to manage online operations, build or source e-Grocery platforms, fulfilment, etc.

## WALL OF COMPLEXITY

- Once grocers decide to bring online internal, they are faced with an ever increasing wall of complexity
- “Grocers we talked with, either had a platform in place... or nothing at all. Either way, they found themselves before a wall of complexity, scratching their head: "How the heck am I going to manage the fulfilment, the pick & pack workflow?". On the top of your head, they could say: "OK, we can handle it, the volume is low, we can deal with it". But in the long run, as volume goes up, as complexity is discovered, it is not sustainable. One thing that works very well is when we show the integration between the frontend, the order management, and the order fulfilment with a dedicated app for the store associate. The empowerment of the store associate has changed a lot from pre-Covid to now. The tech integration and the user experience are now part of the promise made by grocers to the customer.” [Orchestra]**

## OPERATIONAL COMPLEXITY OF E-GROCERY



Source: STIQ Ltd research & analysis

**“Grocers who have used only 3<sup>rd</sup> party fulfilment platforms, like Instacart, may not fully appreciate the operational challenges of fulfilling directly from stores. The biggest issue is how to set up the stores to be able to pick, pack and ship or to do the fulfilment. Do they need to hire personnel? Do they need other technology to be able to support that personnel? How do you train them etc?... Of course inventory accuracy is in there, but it's not the only issue because usually inventory it's... below the middle of the list of challenges that grocers see when they want to take online in-house.” [OSF Digital]**

- For larger enterprise grocers this may take a significant amount of time to push through the organization

**“We work with customers to help them to identify the roles and the time they have to put in to make the transformation happen. Because it's a cross organizational transformation that has to happen on the customer side. It's a very big project... on average I would say, with the enterprise customers which we had... it's a change project that can take years.” [OSF Digital]**

- Such lengthy processes may also be why there is a relative reluctance among grocers to completely break with marketplaces

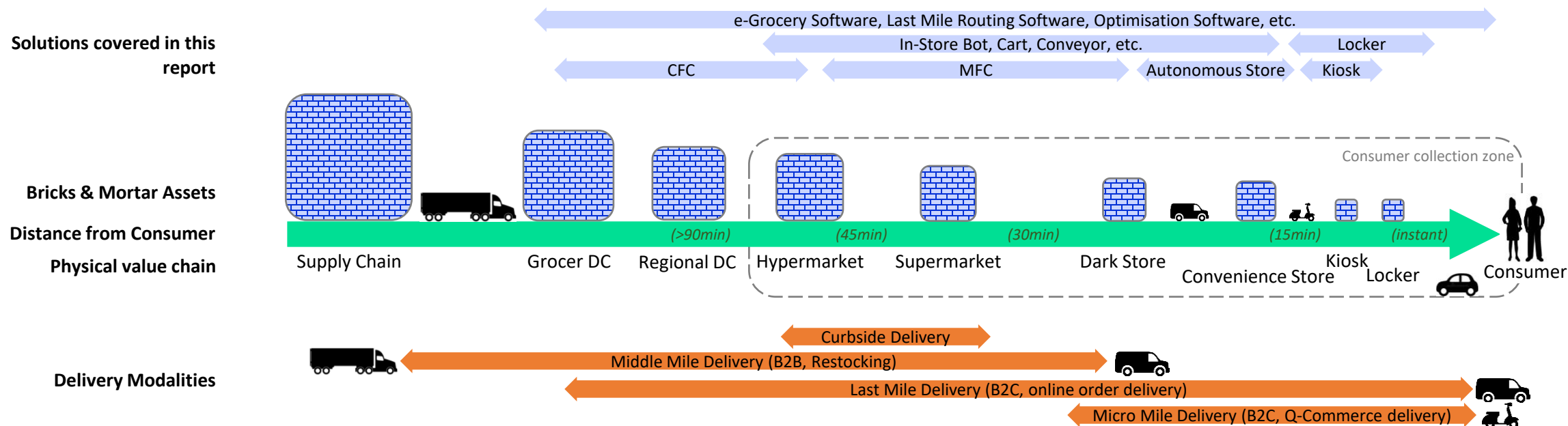
**“The conversations have always been a board level, but the conversation has moved on to how to move traffic from stores to online because the price to fulfil an order is lower for an online order versus when you are doing it in in store... so it's more about how do we do that? How do we position our brand compared with others? Because one thing that changed during the pandemic was that people learned how to buy groceries online and you don't really care when you are buying Danone or some kind of brand, you can buy it from 10 different grocers... so now you have to compete or you don't have the luxury of proximity any longer.” [OSF Digital]**





# NO EASY OPTIONS FOR DECIDING WHERE AND HOW TO FULFIL ONLINE GROCERY ORDERS. FULLY MANUAL, HYBRID OR AUTOMATED FULFILMENT EQUIPMENT?

## SIMPLIFIED 'FOOD SOURCE TO CONSUMER PLATE' ECOSYSTEM



Source: STIQ Ltd Research & Analysis

### DEMAND VS FULFILMENT CONUNDRUM

- In-store fulfilment will always be the first go-to option for Legacy Grocers
- Pureplay grocers may go for centralised options as they generally do not have access to a property estate
- As demand grows for Legacy Grocers, stores may no longer be able to manage volumes as in-store traffic and the level of product substitutions becomes untenable
- Most Legacy Grocers will end up operating a mixture of manual, hybrid and potentially fully automated fulfilment solutions

**“What we see in most of our clients is that there’s a mixed fulfilment footprint. So they may start with in-store fulfilment. Then they understand that they have too many picking mistakes and they need more efficiencies and they move to a dark store and some have also started MFC projects.” [Instaleap]**

- Automation typically enters thinking when growth continues and stores may run out of capacity to fulfil orders manually

**“Let’s say a store can manage c.1,000 orders per day and I’m doing 400 orders a day per store in the US... not France or UK. The store gets 400 orders a day of Click & Collect and has an excess capacity of 600. They may also do some hub & spoke and home delivery outside of that store’s market... and they may also be planning for a doubling in 5-7 years. Somewhere in that time span they will have reached full capacity and may have to build an MFC to gain additional capacity to what has already been absorbed.” [Alert Innovation]**



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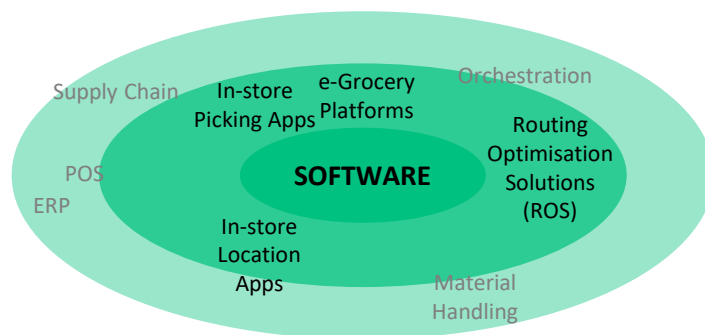
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# THE E-GROCERY PLATFORM AT THE CORE. ADDITIONAL SOFTWARE REQUIRED AS OPERATIONS EXPAND

## E-GROCERY SOFTWARE SEGMENT



Source: STIQ Research & Analysis

## CORE E-GROCERY SOFTWARE PACKAGES

- STIQ identified three core packages used in the creation and fulfilment of online grocery orders; e-Grocery Platforms, In-store Picking Apps and Routing Optimisation Solutions
- There are multiple additional software packages for grocers that often overlap significantly with general merchandise e-Commerce (not covered in this report)

## E-GROCERY PLATFORM SOFTWARE

- The e-Grocery Platform forms a core part of an e-Grocer's software stack
- There are two primary options: headless and fully integrated
- Headless is typically aimed at larger customers with dedicated online teams managing their own front end design and layouts, etc. on a separate platform
- Fully integrated solutions often target smaller grocers without key internal resources; these vendors may offer various e-Grocery management services in addition to the software package

- Most e-Grocery Platforms include modules for In-store picking and some also include routing optimisation tools for delivery vehicles

## OTHER CORE SOFTWARE

- Standalone In-store picking apps were, in the main, offered as add-ons to other software tools, such as planogram compliance tools, etc.
- This also overlapped with other In-store solutions such as shelf labels with Pick to Light functionality, etc.
- Routing Optimisation Solutions were typically supplied by specialists and often included multiple different settings, such as age restricted delivery, returns, etc.
- Routing Optimisation is typically used by grocers with their own in-house delivery fleet

## OTHER RELATED SOFTWARE SOLUTIONS

- Other software solutions not currently integrated with online included a variety of Out of Stock and Planogram Compliance Solutions
- This also overlaps with Supply Chain solutions, Material Handling Orchestration software and POS

## THE INTERNAL E-GROCERY PLATFORM

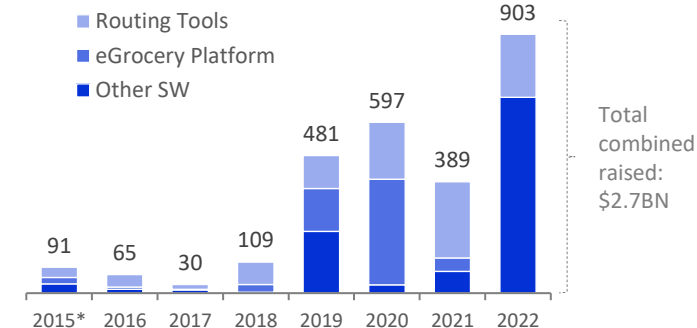
- Interviews suggested e-Grocery Platform vendors viewed internally developed solutions as the main competition

**"I think internal builds are our main competitor to be honest."** [Spryker]

- Vendors experience was that the majority of new customers already had a platform in place, often developed internally

**"Of our customers, 70% had some kind of software platform in place, and typically it's an in-house, a rudimentary solution, and I would say 30% didn't have anything at all."** [Instaleap]

## ANNUAL FUNDING ACTIVITY, 2015-2022 (\$m)



Source: STIQ Research & Analysis. Annual funding. 2015 figure includes funding in all preceding years. 2022 figures to May

- Early Legacy Grocer adopters of online grocery had few tools available to them and often bought in generic e-Commerce platforms and adopted them for grocery
- Conversations with grocers indicated this was still a core strategy for some

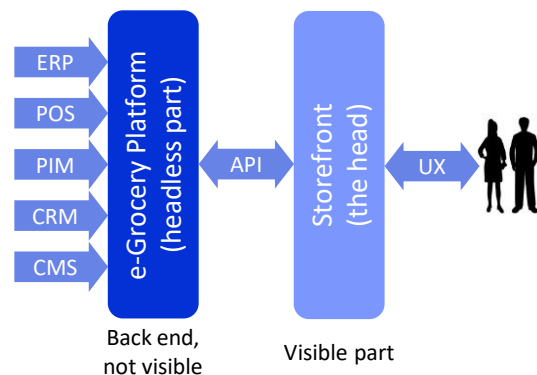
**"We bought in an e-commerce platform around 2004/05 and have developed that internally ever since. Right now we are developing a new platform based on micro services. There are a few reasons why we are developing this in-house. Firstly we have the capabilities internally and secondly we are a very complex organisation and, for example, pricing is a key issue for us. Off-the-shelf platforms do not provide the level of complexity we require, especially on pricing for different channels and store formats. This is really about future-proofing our channel strategies."** [Anonymous Grocer]





# HEADLESS E-GROCERY PLATFORM ARCHITECTURE PREFERRED BY GROCERS WITH INTERNAL ONLINE TEAMS. FULLY INTEGRATED OFTEN SUITABLE FOR SMALLER CUSTOMERS

## HIGHLY SIMPLIFIED HEADLESS ARCHITECTURE FLOW



Source: STIQ Research & Analysis

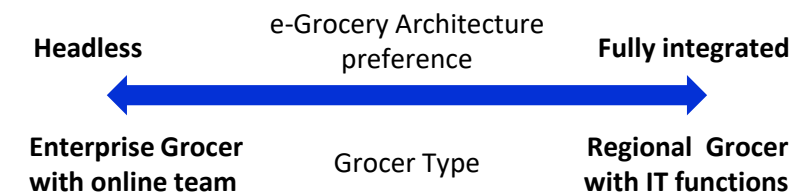
- Headless can be viewed as the piping that makes online grocery orders & payments flow through the system  
“When I think about our platform, I don't really think about the front end of e-Grocery. I mean, we can obviously do that as a competency, but it's not core competency... when you think about the bigger players out there they don't want a new website. They want you to integrate with their front and they want integrated seamlessly.” [FoodX]
- Headless appeared to be preferred by grocers that have already made significant investments in their online marketing teams

“Our solution is headless... we help the grocer build their own grocery ecosystem as they always have their own tech stack and system of records... they have a lot of stuff going on already. Our approach is to tell the grocers that they do not have to go with a rip & replace strategy.” [Orchestra]

- Ocado Solutions also acknowledged the headless trend with the introduction of their own “Ocado Flex” headless solution in 2022

“A lot of grocers, over the last couple of years in particular, have been making significant investments in their ecom. There have obviously been lots of investments in any common kind of web shop... what Ocado Flex allows people to do is take advantage of things like data analytics and forecasting that are kind of core to the end-to-end nature of the Ocado platform, but also not have to write off sort of historic investments... Or investments that they've made over the last few years in their web shop. It just brings an extra level of flexibility to our platform.” [Ocado Solutions]

## E-GROCERY PLATFORM ARCHITECTURE PREFERENCES



Source: STIQ Research & Analysis

## PROFITS ARE LOST/MADE IN THE BACK END

- Whilst online sales are made via the front end, the back end is where a grocer may lose money when not integrated and configured properly  
“Consumers do not see the back end and online grocery sales are not made there. But a grocer will definitely lose money in the back end if it is not properly integrated with your processes and other software systems.” [Emporix]

## HEADLESS E-GROCERY ARCHITECTURE

- Headless commerce ([wikipedia](#)) evolved in the mid 2010's and breaks down e-Commerce software into modules enabling less arduous platform switching
- This architecture has become the leading approach for many e-Grocery platform vendors, especially those targeting larger and enterprise grocers
- The attraction of headless architecture is primarily that it allows grocers to retail with near full control of all consumer facing interfaces, layouts, graphics, etc.
- The headless part includes the “e-Grocery piping”, orchestration, payment flows, delivery methods, order & delivery slot management, etc.







# INCREASING E-GROCERY PLATFORM OUTSOURCING DESPITE HIGH SWITCHING COSTS. INTERNAL DEVELOPMENTS MAY ALSO SUFFER FROM INTERNAL DYNAMICS

## PLATFORM OUTSOURCING MORE COMMON

- The pandemic may have pushed some internal teams to see advantages of outsourcing platforms for scalability and flexibility

**“Our first customer was H-E-B... They had been building in-house technology for 3-4 years before and had got to a point where that just couldn't scale and they wanted to have fast deliveries, they wanted more flexibility and they wanted to bring the same kind of experience that a pureplay digital player has.” [Instaleap]**

**“We recently won a large grocer and they're the leading retailer in the area. It's an interesting story. They do a lot of volume and they built a platform on their own, but realized that they just couldn't keep up so they decided to go out and look for a different solution.” [Local Express]**

## BUT SWITCHING COSTS MAY BE HIGH

- A key challenge with internal platforms may be associated costs with switching to a new platform

**“One challenge that we find is some retailers have taken decisions on legacy systems too long ago and the cost of switching, even if the performance is better with a new solution, it just doesn't happen. The cost of switching is very high. That's the main barrier that we see with jumping into certain specific markets, our focus is on markets where we see retailers leapfrogging into digital with a big ambition and where a lot of them haven't yet spent 20 years trying to correct something with a half-baked technology. Perhaps they've done some steps so they understand it's going to be big and they need as good as technology as it's possible to have in the market. That's our focus.” [Instaleap]**

- Furthermore, coming in too early in the maturing process may not be conducive to the process

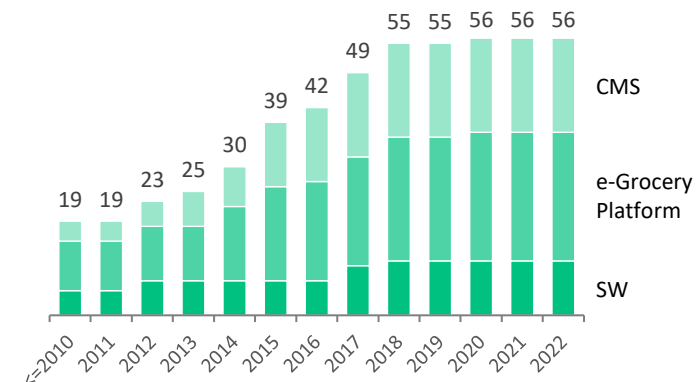
**“All these companies need to make this experience themselves. They need to understand what is possible and what's not possible do in digital... because if you're coming into this as a vendor too early, then who are they going to blame if it's not working as they thought?” [Spryker]**

## PROBLEMS WITH INTERNAL SOLUTIONS

- There are undoubtedly advantages of developing your own e-Grocery platform, such as no perpetual SaaS fees, ability to control roadmaps, customising code and functionality to your enterprise, etc.
- However, it can also be logical to assume internally developed platforms may suffer from corporate dynamics, internal friction, staff movements, etc.

**“When the pressure is ramping up, those projects usually fall apart because the main decision makers are not there anymore, so nobody can control the code. It's usually not following this new composable pattern where you can have very extensive connections to 3<sup>rd</sup> party tools. You are really dependent on some tools selected by the early CTO who was in the project until 2021, but then left for his own startup...” [Anonymous]**

## STARTUP ACTIVITY, <2010-2022 (#), AGGREGATED



Source: STIQ Research & Analysis. Founding year, not when related product added

## STARTUP ACTIVITY SLOWED DOWN

- Startup activity in e-Grocery software segments slowed down from 2018 and whilst the pandemic may be a reason for this, STIQ expects this trend to reverse

## “INNOVATION PURGATORY DIVISIONS”

- Quite a few grocers have spun up innovation teams often dedicated to engaging with promising startups
  - However, these are increasingly viewed as slow death traps that never realise the promise of potential deals
- “Unless you are sold into operations direct, grocers might direct you towards their innovation teams or you know their startup partnerships... which you know it's not the real thing and it's very difficult to move into the operations once you end up with the innovations team.” [Anonymous]**
- Note: STIQ are keen to talk to you if you are a startup or an innovation team with a different experience



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**SEPTEMBER 19-22, 2022  
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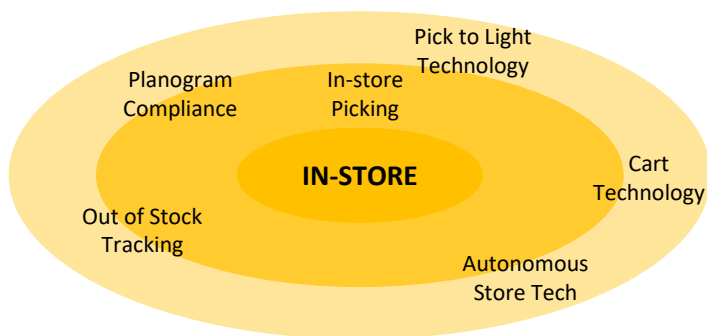
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# IN-STORE PICKING IS THE DOMINANT FULFILMENT PROCESS FOR LEGACY GROCERS, BUT CAN SUFFER FROM A HIGH DEGREE OF INVENTORY ERRORS/ SUBSTITUTIONS

## E-GROCERY IN-STORE SEGMENT



Source: STIQ Research & Analysis

## OVERLAP WITH SOFTWARE + HYPOTHESIS

- This section overlaps with the software segment, but is primarily focused on picking and inventory accuracy
- Note that STIQ has included technologies that are not currently used for inventory accuracy purposes but could hypothetically improve inventory location and counts

## IN-STORE PICKING DOMINATES

- Manual or hybrid in-store pick & pack of online grocery orders will remain the dominant go-to process for Legacy Grocers in the short to medium term

**“I believe it still makes sense for most grocers to pick in store. There is this investment gap. This big step you would have to take if you wanted to have an MFC or if you wanted to have something bigger than your existing in store capabilities.” [Emporix]**

**“One of our larger customers are picking in store. We have worked with them looking at MFCs and things like that. But it's not something they're moving forward with today. I think that the general consensus has just been that it's not something they need to take action on. Today the business is doing well and all the in store pick & pack, while not optimal has been sufficient. They don't view it as an immediate need.” [Grocerkey]**

## INVENTORY ACCURACY: DARK STORES

- One of the main problems with in-store fulfilment is inventory accuracy - both volume and location
- Dark Stores may be a logical go-to solution to solve accuracy in a public facing store
- For Legacy Grocers, Dark Stores may simply add complexity and some grocers have reversed their Dark Store operations

**“Some grocers are closing their dark stores and choosing to fulfil from their network of stores.” [Savills]**

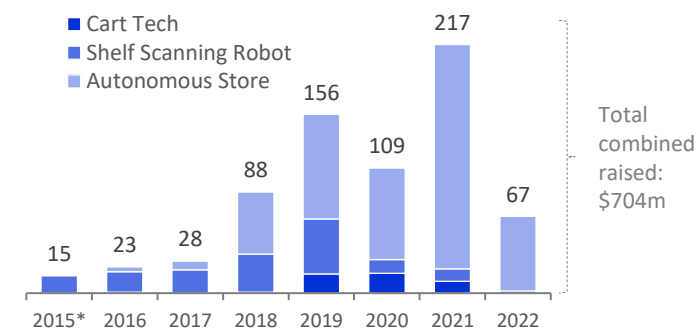
- However, many grocers continue to use Dark Stores, including Q-Commerce companies

## INVENTORY ACCURACY: A KEY TOPIC

- Inventory accuracy has always proved problematic for Legacy Grocers, however, this has amplified with the growth of online ordering

**“Inventory accuracy is becoming a much bigger topic because naturally, if you're picking in store... you know it's got a huge impact on your efficiencies. Retailers are much more focused on that. We've also seen some retailers look at digital shelf tags and to have greater control over their supply chain and share feeds more frequently so that the online assortment is more reflective of what they have in store. It's a much larger topic for sure.” [Grocerkey]**

## ANNUAL FUNDING ACTIVITY, 2015-2022 (\$m)



Source: STIQ Research & Analysis. Annual funding. 2015 figure includes funding in all preceding years. 2022 figures to May

**“One of the reasons grocers have seen increasing issues with out of shelf and out of stock is mainly because they now embrace online delivery... fulfilling online orders directly from stores is adding pressures on their replenishment processes. Of course they're trialling different things to fix this, maybe they have MFCs for deliveries and so on, but I think >90% of fulfilment still happens in store.” [Neurolabs]**

- Substitutions is a popular functionality, but does not solve the frustration for consumers

**“Inventory accuracy is one of the biggest issues for grocers and it's one of the biggest frustration points for customers. We have a lot of analytics and track substitution rates and item availability... Our customers are trying to use that information to help figure out what their SLAs need to be on different products. It's something that we've thought a lot about because it's such a large problem for the industry.” [Wynshop]**





# LEGACY GROCERS ARE OFTEN AT VARIOUS LEVELS OF INVENTORY MANAGEMENT MATURITY. VENDORS OFFER TOOLS TO IMPROVE IN-STORE PICKING EFFICIENCIES

## HYPOTHETICAL ONLINE GROCERY FULFILMENT COSTS (SAMPLE ONLY)



Source: STIQ suggestions. Note that numbers used in this graphic are only representative and should not be used to calculate profitability/losses for in store fulfilment processes

## DIFFERENT WORKING PRACTICES & IMPACTS

- Grocers have evolved at different pace & directions in how they manage in-store inventory
- For example, the responsibility for on-shelf inventory availability may be outsourced

“Another good example is a supermarket we work with in Spain... The responsibility to keep the shelves properly stocked is with the brands. So the brand would send their own people to stock up the shelves. Now that online fulfilment is done directly from the store... this caused huge discontinuity and inefficiency in how the whole thing happens. The supermarket wanted a solution to have real data when they go back to the brand and say “hey, you know we agreed SLAs but you’re not doing a good enough job”. I think just providing increased store level visibility might help to create this wholly smooth omni channel experience.” [Neurolabs]

- Different grocers may also often be at different levels of inventory management maturity or may in some cases not be aware of processes
- “What we discovered working with different grocers is... when it comes to supermarkets they are all at different levels of maturity, even like in terms of how they manage their stock inventory, but also in terms of how much visibility they have, or like awareness they have of the processes and so on.” [Anonymous]
- In store pick & pack of online orders often suffers from efficiency and profitability issues partly brought on by on-shelf inventory accuracy issues
  - These issues often extend beyond the shelf and involve problems such as stock remaining in the back of the store instead of being put out on the floor, etc. (not covered in this report)

- Stock outs is not only an issue when in store, but also with potential returns

“Stock outs is a huge problem. You have a much higher failure rate ordering online... some people just aren’t in when you knock on the door and all that kind of stuff. You’ve also got a very high waste rate for grocery online. When that has to go back into a shop... so you’ve got to bring it in the back door and try and depick it all and put all the fresh produce back. It’s very wasteful because it’s difficult.” [TGW]

## IN-STORE PICKING EFFICIENCY

- Plenty of vendors are increasingly focused on improving efficiencies for in-store picking
- “One of our customers used a B/W text-based picking device. Now they use a colour display and pickers see a picture of the goods... this may sound ridiculous, but it makes a difference for somebody who gets quick training and when you have to pick a new product.” [Emporix]
- Product location is also a key issue for 3<sup>rd</sup> parties as they send pickers into stores
- “We work with a few grocers and delivery companies to improve inventory accuracy... actually finding the goods faster.” [Orient]
- Picking efficiency tools now extend to hardware and warehouse picking concepts
- “We don’t just batch orders randomly. Our software distributes orders to pickers based on their experience. New pickers do smaller orders and experienced pickers with lower error rates and problems get the bigger and more difficult orders.” [Paycon]





# THERE ARE POTENTIAL FUTURE SOLUTIONS TO BATTLE THE IN-STORE FULFILMENT PROBLEM WITH INVENTORY ACCURACY

## STIQs HYPOTHESIS RE INVENTORY ACCURACY

- STIQ interviewed a number of companies providing autonomous store technologies to explore to what extent these may be deployed to improve inventory accuracy
- STIQ also reached out to shelf monitoring companies working mainly with gap analysis and planogram compliance for the same purpose

## AUTONOMOUS STORE TECHNOLOGY

- An Autonomous Store allows customers to enter, grab items, and leave bypassing a normal 'till check-out'
- The inventory accuracy problem resonated with many of the vendors interviewed and some had had conversations with grocers re inventory issues

**"Inventory management is always a topic that we discuss with our clients. Right now our main focus is on the autonomous checkout. We want to offer an end to end user journey for consumers and you can imagine inventory management is a service that we could provide to our clients including better prediction and how that relates to shopper intent... when they grab some items, put items back and all those data we can actually collect almost in real time. I would even argue some of this data was never collected before. Now we can provide that tremendous amount of insights to our clients."** [AiFi]

- However, inventory accuracy appeared to be a separate problem that may be difficult to solve in the shorter term
- Interviews indicated that as stores become increasingly digitised there may be further opportunities for inventory accuracy technologies

**"Inventory accuracy was never mentioned in our conversations, but I think it's interesting... and one of the things that we got is that grocers try to mix the different sales channels. Obviously if you start digitizing stores, now you have sensors that could replicate some things they've already done in e-commerce.... some analysis of the customer journey, touch points, etc."** [Sensei]

- Autonomous store processes appeared to mirror how e-Grocery Platforms work, i.e. reserved stock when picked

**"Once a person picks an item, it is considered reserved until the person checks out. It is returned to store inventory and set to available once returned to the shelf again."** [Anonymous]

- However, none of the autonomous stores currently provide an in-store/on-shelf inventory count

**"It's not mandatory for the system at any given time to know how many bottles there are on a shelf... it's obviously super valuable data and we are doing all kinds of POCs to perhaps use such data."** [Anonymous]

- Although, some vendors have added similar functionality developments in their longer term roadmaps

**"Especially today with all the supply chain issues and the lack of labor... perhaps automating gap scanning and similar things is crucial... and it connects the ecommerce to the grocery store. If I order from a store near my house and know half the products are missing, but nobody told me on the website they were missing then I might be an unhappy customer. And, the supermarket's unhappy because I ordered a lot less than I could have done. It's definitely something that we're working on."**

[Anonymous]

- Planogram Compliance and Shelf Auditing are increasingly interesting for Legacy Grocers as well as suppliers

**"Our synthetic data approach includes an application which we call shelf auditing... there are field force management companies that work on behalf of the CPG brands to make sure the store execution is right. We have also connected to ERP and have visibility of stock on order and so on... so we can tell them, OK, you're out of this product, but according to what we see you should have the product in the warehouse. We would send a notification in real time... and actually what they discovered was that for more than half of the out of shelf notification, the products were somewhere sitting in the back. But the store people weren't very efficient in restocking the shelves."** [Neurolabs]

## SHOPPING CARTS AS PICKING TOOLS

- The pandemic caused some unintended consequences and one of these was carts to fulfil online orders

**"We initially introduced the consumer smart shopping cart to a grocer and they deployed across multiple stores...and then overnight the pandemic hit and it didn't make sense to continue. But, at the same time online orders started going up and we pivoted to focus on optimization of picking... Our hardware and software is now used to increase productivity of picking online orders. Using a cart increases the speed and orders processed per picker..."** [Paycon]





# ADDING NEW TECHNOLOGIES MAY IMPROVE EFFICIENCIES OR SIMPLY DISGUISE INEFFICIENCIES. AUTOMATION MAY ULTIMATELY BE REQUIRED

## 100% INVENTORY ACCURACY IMPOSSIBLE?

- Interviews suggested it may be impossible to gain full visibility of store stock in real time simply due to the nature of consumer's shopping missions

**"Is there software that's going to improve the in store picking? I would say improved, but to get it 100% right is impossible. If it's my turn for soccer and I got to pick up the treats then I'm going to buy everything on the shelf... and every picker is screwed. And that's just not in anybody's model... it's just the dynamic of the floor environment. More customers are talking to us about getting all products in the automation."** [Alert Innovation]

- Some form of automation may ultimately be required as order volumes increase and outstrip the manual in-store picking capacity
- Interviews suggested there may be a threshold of around 20% online penetration of a store's revenue at which a store may consider automated options

**"When more than 20% of a single store's sales are online, retailers should be transitioning to robotics or dark stores to increase efficiencies and profits."** [Stor.ai]

## AUTOMATION ULTIMATELY REQUIRED

- Adding automation equipment to the pick & pack process will improve inventory accuracy as goods are stored in sealed off storage & retrieval systems (ASRS)
- However, equipment on offer to date, such as MFCs, have tended to store a majority share of goods in the ASRS with the long tail still picked from stores

- Furthermore, automation equipment may require Capex investments and ROI suggestions for boards to approve
- However, such ROI remained in a state of flux and varies with grocers maturity as well

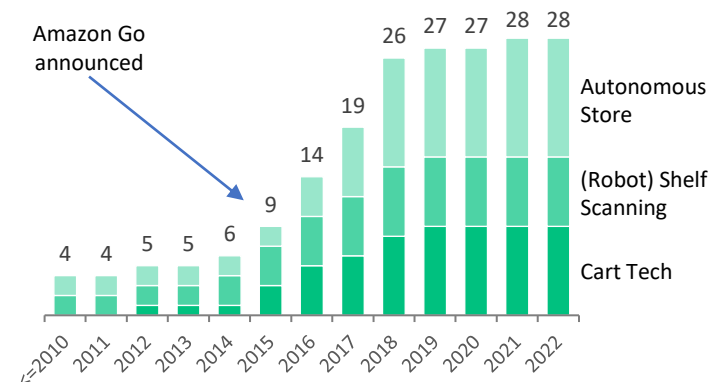
**"ROI of MFCs is yet to be proven simple. Customers are still optimizing technology, processes and integrations. It's an ongoing process... a mixture of technology, people and processes and how to marry that with the long tail of items that still need to be picked in the store. ROI is evolving... in the UK the hurdle is much higher because they're picking at 100+ units fully loaded versus 40 in the US... British grocers have been doing it for 20 years and when you're already picking at 100+, then it's not about efficiency so much as better experience, less stock outs, etc. That's why in the UK you've seen very little MFC action whereas in the US, if you're only at 40, you can leapfrog to... the equivalent of 60+ or more with some Capex expenditure."** [TPG]

- And, in countries with lower salary pressures, there may not be a positive ROI for automation Capex

**"One thing that we see a lot in Latin America is manual dark stores. So they get a lot of efficiencies through our software, but they don't have necessarily the Capex of the machines."** [Instaleap]

- However, readers should note that interviews for STIQs other reports have indicated that ROI can sometimes pivot to meeting customer expectations (SLAs) rather than pure ROI calculations depending on volumes and access to labour, etc.
- See also "ROI & Experimentation" [page 40]

## STARTUP ACTIVITY, <2010-2022 (#), AGGREGATED



Source: STIQ Research & Analysis. Founding year, not when related product added

## STARTUP ACTIVITY, IN-STORE TECHNOLOGY

- The In-store segment has largely trended new product announcements by Amazon
- Amazon Go was announced in 2015 and Amazon Dash Cart in 2020 (although STIQ presumes the technology was shelved for a while before making it public)
- Readers should note that this chart does not include other solutions on the market, such as Pick to Light shelf labels
- The slowdown in new startups joining the sector broadly follows the sector as a whole
- STIQ expects more startups to appear in the sector as a result of the pandemic
- **Note: STIQ are keen to talk to you if you are a startup or an innovation team with a different experience**



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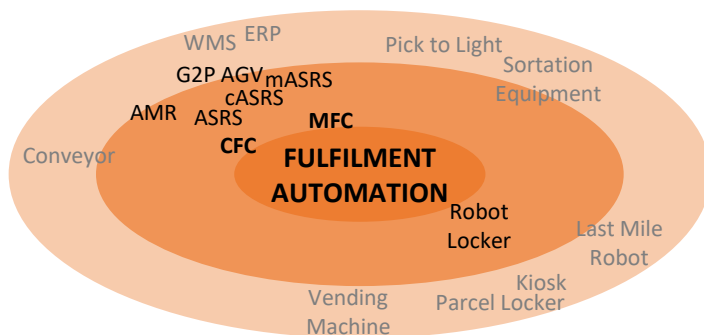
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# FULFILMENT AUTOMATION DEMAND MAINLY DRIVEN BY PUREPLAY ONLINE GROCERS. LEGACY GROCERS STRUGGLING WITH OTHER PRIORITIES IN THE SHORT TERM

## E-GROCERY WAREHOUSE AUTOMATION SEGMENT



Source: STIQ Research & Analysis

## E-GROCERY AUTOMATION

- There is a wide range of fulfilment automation options for grocers which overlap significantly with Goods to Person Solutions – covered by STIQ [here](#)
- Furthermore, STIQ will cover Last Mile Robots in a new upcoming report (download [here](#))
- This report focuses exclusively on CFC, MFC and automated Lockers

## PUREPLAYERS DRIVING DEMAND

- Interviews appeared to suggest there were two main trends in demand for automation equipment
- Pureplay grocers had driven demand for more centralised options whilst Legacy Grocers were mainly focused on MFCs

**“We were in a huge project with a Q-Commerce player. It's very interesting the approach they have because we are talking about a centralized warehouse with them.”**  
[Knapp]

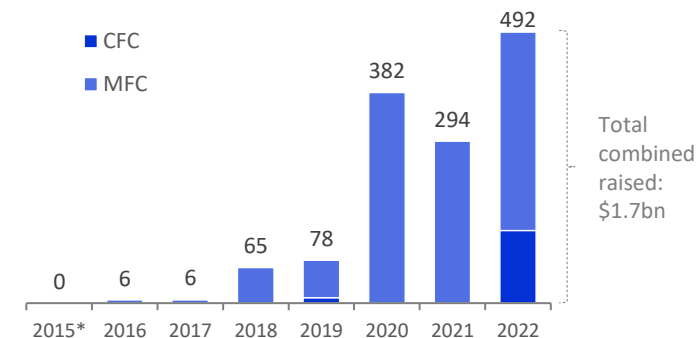
## MUTED DEMAND FROM LEGACY GROCERS

- Interviews suggested the lack of demand from Legacy Grocers may be due to a variety of issues, such as changed priorities in a post-pandemic world
- Furthermore, some grocers may also have been able to fulfil the bulk of orders from stores using manual picking

**“I think many grocers realised they can fulfil quite a large portion of their online orders in store... this helped them survive the peak of the pandemic... now customers are anyway coming back to stores and this has probably eased the pains some of them felt during the pandemic with this huge increase in demand. This might also have slowed down their sense of urgency in investing in automation. For example, I think what has really become quiet is the MFC topic. There has been far less noise around this topic recently.”** [TGW]

- Interviews also hinted that grocers may have become saddled with significant technical debt in their systems throughout the pandemic
- “Grocers have many different priorities and I think one of these is the technical debt they built up during the pandemic when they just needed to get something up and running. This is perhaps where they are spending quite a lot of efforts now. But some of our grocer customers also have 100 different projects and trials going on. They are definitely not sitting back.”** [Anonymous]
- Whilst others simply thought that Legacy Grocers are well known to act slowly
- “The grocery industry is notorious for going very slow.”**  
[Anonymous]

## ANNUAL FUNDING ACTIVITY, 2015-2022 (\$m)



Source: STIQ Research & Analysis. Annual funding. 2015 figure includes funding in all preceding years. 2022 figures to May  
Note: Locker technology companies had raised a combined £1.4bn, but most of these companies operate exclusively in parcels and ambient goods delivery

- Supply chain disruptions were also affecting the ability to roll out
- “Supply chain disruptions are affecting projects. The biggest thing at the moment is the Chinese lockdown. There are quite long delays already and this is without shipping delays which may add additional time.”**  
[Anonymous]
- And, early adopters of MFCs may also have started realising some of the limitations of the equipment
- “That's some of the reality of the MFC. Can we put it into a shop environment and make it simple enough to use and operate?”** [Dematic]







# SILENCE OF THE MFC SIMPLY THE CALM BEFORE THE STORM?

## MFCs GO QUIET IN 2021/22

- The most widely disseminated fulfilment automation solution in recent years has been the MFC
- But these featured less prominently in media in the last 12 months with few, if any, new customer and/or deployment announcements

**“MFCs were still hugely important during Covid, but they got a little bit less mindshare for about a year and a bit...”**  
[Takeoff Technologies]

- Early adopters may have jumped into the MFC lake to trial these new solutions

**“From an MFC point of view it’s gone a bit quiet. You have a few customers who saw MFC as being a cheap way to dip their toes in the water of automation within grocery. But probably what happened was those customers did one or a few to actually understand the costs and complexity of managing and maintaining these solutions.”**  
[Covariant]

- Interviews suggested that duplicating inventory and WMS/material handling capabilities were not optimised for distributed fulfilment (MFCs)

**“There’s two things why it’s [MFCs] not happening right away everywhere, and it’s not called on so quickly. Number one is inventory carrying costs tend to go up, so you have to be very intelligent about how you move your inventory and when you move it. Otherwise, you’ve got inventory everywhere and done nothing but populate more of it without really matching it to demand. The second thing is WMS systems or order allocation systems don’t know how to manage inventory in multiple locations to match the demand itself. There are some systems out there, but they don’t do it well.”** [Vargo]

- Interviews with software vendors highlighted that the frantic partnership activity evidenced in 2021 had died down

**“Conversations with MFC vendors have cooled in the last 12 months. There was some last year. I think it’s because... as you know, in the US access to labour is a real issue. So for them it’s probably less risk to turn to a DoorDash or an Instacart to do the in-store pick & pack and delivery then to make the capital investment required for a robotic fulfilment centre.”** [Mercatus]

## THE CALM BEFORE THE “MFC STORM”

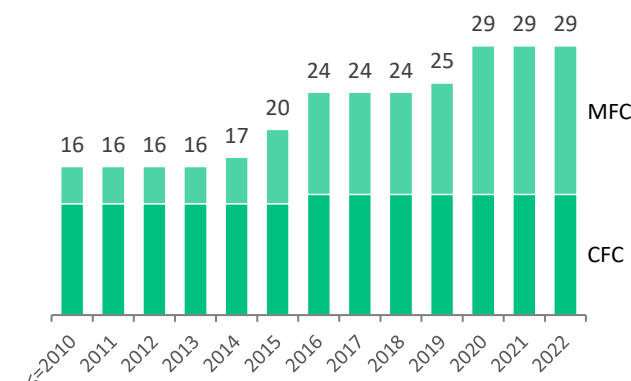
- Some observers suggested that the reason MFCs had quietened down was simply the calm before the storm
- “In my mind, this is the calm before the storm. Because most of the grocers are doing POCs and pilots... once upon a time this was the same way with CFC’s. A number of grocers needed to see the output of the CFC before really pushing for it, and we see now the push coming through MFCs. We are probably one or two years further back with MFCs now.”** [Anonymous]

## EARLY INFLECTION SIGNALS

- Most of the Legacy Grocers that have announced MFCs appeared to be at various stages of piloting them
- A few early adopter grocers, including Tesco and Walmart appeared to be working on more significant MFC deployments

**“We have plans to open at least 25 urban fulfilment centres in the UK, as part of a plan to double the capacity of our online grocery business. These centres make use of existing surplus space in large stores, with a more efficient, automated system in a small footprint.”** [Tesco, 2020 AR, p7]

## STARTUP ACTIVITY, <2010-2022 (#), AGGREGATED



Source: STIQ Research & Analysis. Founding year, not when related product added

- Further grocers were also lining up to do trials
- “MFCs are something we are looking at intensively. At the moment we are exclusively picking from store.”**  
[Anonymous Grocer]
- Walmart was viewed as the elephant in the room and many grocers may be waiting on what they will release
- “Everybody is waiting on what Walmart will release. Because they announced a huge MFC program. It’s also something that is still up in the air for the winners and everyone wants some piece of the MFC cake.”** [Knapp]
- Vendors indicated there was a rejuvenated sense of activity in the MFC space
- “What we’ve seen in the last year is a substantial pickup in that activity. We’re seeing a pickup in our pipeline.”**  
[Takeoff Technologies]





# THE MFC MAY HAVE TO HAPPEN, BUT WAS NO LONGER VIEWED AS A SILVER BULLET. MEANING OF MFC CHANGING INTO A PRINCIPLE RATHER THAN A SOLUTION

- Others indicated the MFC has to happen as grocers will run out of fulfilment capacity in stores

**“MFCs have got to happen for two reasons. One, centralized labor. You can't get 1,000 people in an area when you're competing with other companies that also need 1,000 laborers. If you're doing MFCs you're competing for 50-100 people in a smaller region. It's all about transport and speed. The only way that you're going to get to speed & delivery without breaking the bank is to minimize your last mile. Last mile is the most inefficient of transport costs... You can maximize efficiency to the MFC and only pay for 10 miles versus 500 miles.” [Vargo]**

## **THE MFC NO LONGER A SILVER BULLET**

- There has been a realisation that grocers may require different automation solutions based on their customer propositions and where demand is located

**“There isn't a single automation solution that's going to solve the grocery problem next year. It's going to be an accumulation of knowledge on what the right technology is for the centres that are offering the services to the customer. This is what we continue to focus on is investing and learning with our clients.” [Dematic]**

- Vendors viewed e-Grocery automation through a network lens with a combination of sizes of fulfilment centres

**“We view online grocery as a network approach... a combination of big warehouses, smaller units going down to really, really small pickup places somewhere in the cities. All connected through our software solution, connected in the material flow. This is a bit more holistic view. We also do MFCs, but mainly via our partnership with Takeoff.” [Knapp]**

- Many grocers have also matured in their approach to the challenges of online grocery fulfilment

**“We analyzed at length the maturity of grocers and their online experience... and even though they became more mature over time, they are not as mature as general merchandise and apparel retailers. They are still considering options. For instance, MFCs are just an option, not being the end of everything, so...” [Orchestra]**

- Whilst others took a dim view of adding automation to stores which are in effect live production environments

**“We take quite a dim view of automating stores generally. we think it's just a poor investment. You can physically do it but it's a real headache. Who wants to put automation in a customer facing environment? You can't shut the shop. You can't close the back. You know you can't pilot it, the floor isn't fit for purpose. It doesn't have the right power. It doesn't have much height. There's columns everywhere. It's a logistical nightmare trying to install into a shop. And all of that extra cost and time that you don't want. And then when you get it done, it's just one shop. And you you've got like 300 or 600 of them.” [TGW]**

## **DEFINITION OF MFC CHANGING**

- The MFC means many different things to many different people and has evolved from the early days

**“It's always a question of how do you understand the term micro fulfilment centre. As a definition, it was started about 2-3 years ago with, let's say 5000 sqft. Then it became 10,000 sqft and now most of the suppliers talk about 15,000-20,000 sqft. So you can already see they are moving away from that ultrasmall in-store story which let's say, initiated this MFC kind of hype.” [TGW]**

- Some would even say the term MFC has lost its meaning, including early pioneers of the concept

**“... Hyper Local Fulfilment, and I'll use that term versus MFC... the term MFC has been diluted...” [Takeoff Technologies]**

- In parallel to grocery MFCs there has been significant development in the general merchandise retail sector with MFCs adding another layer of confusion

**“MFCs goes all the way from fashion to pharma to spare parts. I mean, there's a lot of different uses for MFCs but e-Grocery is the one that takes the spotlight.”**

**[Anonymous]**

## **MFC, A PRINCIPLE RATHER THAN A SOLUTION**

- Interviews suggested the term MFC is related to a principle of adding distribution closer to consumers

**“We believe hyper local fulfilment is designed to have the right amount of automation close to the customer which allows you to both eliminate last mile costs and deliver quickly to customers.” [Takeoff Technologies]**

**“We have found that the MFC term is about the principle of what retailers try to do, whether they're attached to a store or not. Different retailers will have different assets available to them in certain places. One of the challenges that retailers have is they've got stagnant assets on board. They've got to do changes in their network design so things move around. And some are taking the opportunity to fill those voids with the technology. If it was put in the back of the store, it would be an MFC. But if it is in a warehouse, it's actually in a box, so do you call it an MFC or is it actually a mini CFC? And I think that's the thing that we're experiencing... retailers seem to be sort of floating that line between the two.” [Swisslog]**





# THE “MFC 2.0” APPEARED TO HAVE PUSHED VENDORS INTO A MORE CONSULTATIVE APPROACH

## THE MFC 2.0

- With MFCs being so new, most vendors have conducted research, listened to customers and improved solutions **“What we saw is that many of the grocers that invested in MFC technology looked how it worked to explore if they could build a business case around it. Many grocers outside of Europe tried it. We did many many interviews with customers together with Takeoff to understand what the solution was missing and we have reacted to it and I think we are in a good way to reignite this business.” [Knapp]**
- Some vendors have developed different sized formats **“We're already working on our larger format solution, but it's a function of the demographics. If you are near Manhattan or Orlando... a larger facility to serve that area may be the correct solution. I live in suburban New Hampshire and if you're an hour outside of the metro area, you're going to find that MFCs that leverage existing real estate and existing supply chains are going to be the correct solution. So it's not a one size fits all you've got to look at the demographics, the immediacy requirements and deliver the right solution to the market.” [Alert Innovation]**
- Interviews hinted that grocers are increasingly interested in stocking the full range in MFCs or an automated process, effectively separating supply chains

**“I think it comes down to fulfilment quality. This is very important for our customers. Fulfilment quality in terms of having all the SKUs in one place so that you really can serve the complete order from one system. Obviously MFCs have been restricted because you're restricted to certain number of SKUs. That you can really fulfil a complete order, but that of course takes time, because picking in the shop is obviously not very effective. So what we did is increased the service quality... it means automating of processes that haven't been automated before.” [Knapp]**

- MFCs may also be merging into a larger “e-Grocery fulfilment thinking” piece

**“As we look at the future... we started with shuttles and followed that up in 2021 with an AutoStore offering. And now we're exploring our relationship with Quicktron for MFCs.” [Dematic]**

## A NEW SALES APPROACH

- The change in grocers and vendors thinking also appeared to extend to the sales process
- Vendors appeared to lean towards a more consultative approach working together with grocers to evaluate the suitability of various systems and solutions

**“I think grocers have gone from frantic decision making during the height of Covid to a more methodical process. We're not selling grocery automation, this is a business process, a consultative sale. The worst thing we could do is sell a bunch of robots and it turns into a boat anchor for the customer. What is their customer promise? What is their assortment? How do we size the system? How is it going to work over a 24 hour period... It's all about the business process and how the machinery best supports that process. Grocers are taking their time and they're being smart about their decisions.” [Alert Innovation]**

**“We tell people that the vending machine is only about a third of the whole story, especially when it comes to grocery. Because they do have such a large SKU range that you're going to need to have either a super large system like an Ocado system, or you're going to have to rely on some type of pick operation happening at store level that's being serviced by maybe a hub MFC. Or maybe a complete back of store solution where they're augmented to one another. That's really what we've been focused a lot on, the logic between doing both of those. Can I take a dark store in a rural area that can serve 40,000 SKUs and augment that with some local stores that are doing some very unique picks? Maybe my counter picks my alcohol and some of those things. And can I combine those two together to be more efficient with a click & collect operation? That's where we really put a lot of energy and effort in our software side is managing that distributed network of opportunities.” [Dematic]**





# FOR LEGACY GROCERS, LEVERAGING THEIR PROPERTY ASSETS MAY BE KEY TO SUCCESSFUL ONLINE FULFILMENT

- The leading material handling system integrators consider a more nuanced approach to e-Grocery fulfilment based on utilising Legacy Grocer's existing infrastructure as opposed to a rip & replace strategy  
**"Automation should fit the network model that it goes through. You can look at fulfilment in a number of ways but ultimately it has to drive the network model and that's about miles on the road and optimizing efficiencies that you get in the box compared to cost on the road. So if you're sub-optimizing your delivery network to be able to do that, then you may be compromising the wrong thing... but combining those elements together, leveraging off the stock, and everything else may have some great benefits for grocers."** [Swisslog]
- Understanding the complete network picture can be an important part of the e-grocery puzzle  
**"For us it's about trying to understand what bits of the network you need to keep where. And by that I mean you want to keep the last mile delivery as close to the customers as possible. But that doesn't mean that you have to pick it close to the customer. So you can move some picking further upstream. The downside with that is obviously speed, but not everybody wants it fast. I do see a future where retailers have a variety of ways to pick an order, and that could be a variety in terms of location, how far it is... so the longer lead time on the order, the further upstream it goes. But also flexibility in terms of geography. So just because I have a store on the doorstep doesn't mean it has to come from there. And you should have better geographical flexibility to pick orders where it makes sense to pick them. It's not an easy thing to fix, it's a complex strategy that you need to put in place."** [TGW]

- An important aspect is also continued optimisation of the e-Grocery infrastructure systems and solutions that are put in place

**"I think there's loads to be squeezed out of route planning and that's something that we want to explore as part of our Network Solutions."** [TGW]

## NON-STORE BASED GROCERS

- Interviews suggested centralised fulfilment may be the optimal solution for grocers that do not need to leverage extensive store estates

**"If you don't have stores, centralized fulfilment is obviously the only way to go."** [TPG]

- Although, some players in the Q-Commerce segment have acquired legacy convenience retailers with store estates
- Interviews also hinted at reservations about fulfilment automation technologies suitable for Q-Commerce players

**"Q-Commerce players, Getir, Gorilla, Zapp, whoever, they're all nonconformant. They're all completely different, so introducing automation or a proprietary system in that space is going to be incredibly difficult because of different ceiling heights, different floor load bearing capabilities, different room sizes. So how do you handle that kind of variability?"** [Anonymous]

- The Q-Commerce business model, in particular, was also not amenable to a lot of optimisation

**"From a delivery optimization perspective, quick commerce is a catastrophe. You can't optimize by definition. These are one offs. It takes you on few minutes to do the pick & pack and then the driver needs to rush to your place and then get back to the warehouse and that is it. So you can't achieve all of these efficiencies that route optimization brings with it."** [Urbantz]

- Although, some interviews highlighted that the size and maturity of Q-Commerce players did not yet warrant highly complex WMS functionality

**"Q-Commerce players don't yet have a compelling need to have a robust WMS and I think they're focusing more on the front end e-Commerce platforms. Few if any of them have large DC facilities and tend to operate dark stores. Some Q-Commerce players are also pretty interested in automation though... one of the things I am constantly hearing is a lot of these players are looking for a light WMS inventory management labor solution that will come pre-integrated with robotics and automation."** [Bricz]

- However, Q-Commerce companies were among the many inquiries to automation vendors

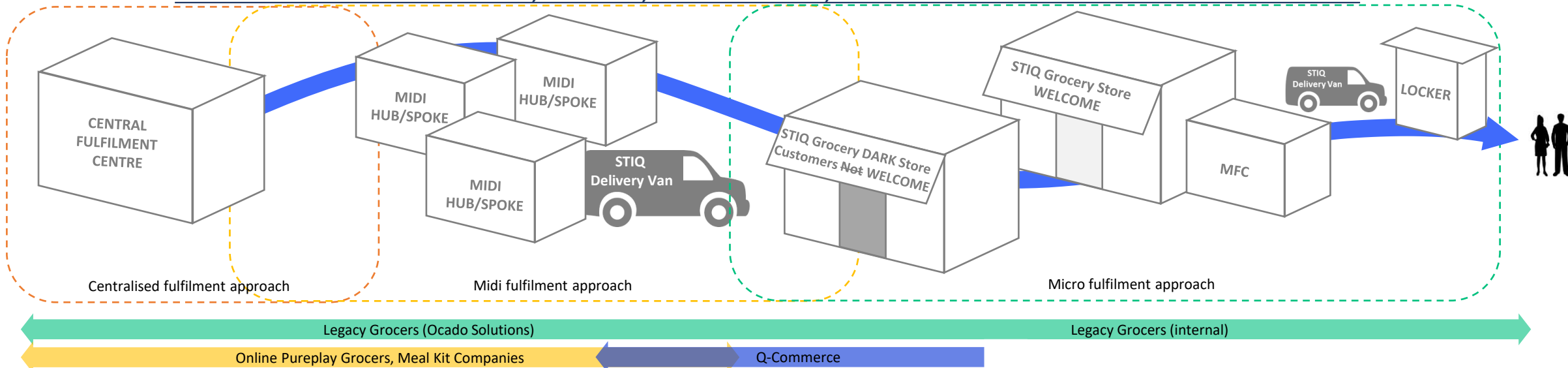
**"Our chilled solution is still under development. I think we'll be able to do a chilled application towards the end of the year. We have one of the leading quick commerce companies in Europe looking at a system now. The cool thing with these quick commerce companies is that it's 1000 SKUs with 1 pick station, so it's a rather small system, which is awesome."** [Urbx]





# AUTOMATION MAY VARY BETWEEN GROCERS AND BUSINESS MODELS

## SAMPLE ONLINE FULFILMENT PROCESSES, SOLUTIONS, LAST MILE OPTIONS, TYPICAL TECHNOLOGY & TYPE OF GROCER BUSINESS MODEL



Source: STIQ Research & Analysis

### A RANGE OF FULFILMENT SOLUTIONS

- Interviews suggested there is no single answer on how to fulfil online grocery orders

**“I think what we’re seeing is there is no single answer in the grocery space for fulfilment automation. It’s going to be very much about the market that you’re servicing. What your clients appetite is for immediacy and then trying to balance against that expectation. Right now we’re seeing a lot of blended strategies by grocers. Some are using Instacart for immediacy but also offering their own curbside delivery.”** [Dematic]

**“I believe there will be a portfolio of different e-Grocery fulfilment approaches in the future.”** [Takeoff Technologies]

- One potential outcome is different sizes of fulfilment centres, often depending on the customer proposition and population densities
- “I don’t need to have an MFC in every store. In fact, I may not even need one in some markets. In select markets I may want to use a larger dark store solution that delivers an even higher level of automation and more labor resiliency. If you look at purely a single MFC filling 700 orders a day, your ROI is not solely based on labor savings, but rather the overall efficiencies, quality improvements & customer experience. Incremental capacity and opportunities to sell, more orders in the timeslots customers demand, more efficient van routes departing, and faster fulfillment for curbside pick-up.”** [Dematic]

- For Legacy Grocers it makes sense to leverage their existing property portfolios
- “Your variable costs and your infrastructure costs, land & assets, can vary by 5X. It can’t be a one size fits all solution when your other costs apart from c.20% of the initial capital spend can vary by five times. I just don’t feel that there is a silver bullet for online grocery fulfilment. You can look at models and see how they’re trying to look at different things and solve different challenges, but I think there are horses for courses and dependent upon where in the world... and where grocers are on their grocery fulfilment journey there will be a different prescriptions for what they need. Micro fulfilment is absolutely one of the most popular things, and one of the right things for people to be able to do at the moment.”** [Swisslog]





# FULFILMENT AUTOMATION: COMPARISON CFC VS MFC

## CFC VS MFC COMPARISON CHART

	<u>CFC (Central Fulfilment Centre)</u>	<u>MFC (Micro Fulfilment Centre)</u>
<b>SITE SIZE</b>	Usually >200,000 sqft	10,000 - 15,000 sqft
<b>WEEKLY ORDER CAPACITY</b>	Anywhere between 50k to 200k OPW	~500 - 1000 OPD
<b>SKU RANGE</b>	Usually >30k SKUs. CFCs are usually large enough to not constrain the range	Usually around 5k to 15k SKUs, depending on site size. Range size and site / automation size are tightly related in an MFC
<b>CUSTOMER LEAD TIME</b>	Next-day, sometimes same day	Usually within 1 hour, with some facilities also offering same-day
<b>CUSTOMER DELIVERY OPTIONS</b>	Home delivery only	Home delivery and in-store pickup
<b>DELIVERY VEHICLE</b>	Usually a mix of LGVs and vans	A range of bicycles, EAVs, scooters, motorbikes and cars
<b>DELIVERY COST</b>	"Medium to low". CFCs usually serve a denser customer base, and the next-day proposition allows for optimisation of vans and hence high van utilisation and lower delivery costs	"High". Quite often a courier or delivery driver is only delivering one order at a time
<b>SUPPLY CHAIN</b>	Are large enough to receive stock directly from suppliers, from consolidators or other distribution centres within the grocers network	Usually have to use the grocer's existing distribution network
<b>WASTE</b>	"Low". The ambient and frozen areas are large enough to house products for long periods of time, and the volume of orders allows quick rotation through chilled products	"High". If receiving case supply from a distribution centre, this can result in more items being sent than are needed. This can be minimised in several ways: <ul style="list-style-type: none"> <li>• co-locate MFC with an existing store and share the inbound supply</li> <li>• supply MFC at an individual item level</li> </ul>
<b>SITE LEAD TIME</b>	Usually 2+ years, Recent Picnic site suggest vendors can reduce to ~21 months once a site has been secured	Unknown, but should be quicker because sites are much smaller
<b># TEMPERATURE ZONES</b>	Usually three - Ambient, Chilled and Frozen. Some grocers introduce an additional zone called "produce", which is held at a temperature between ambient and chill	2 or 3, depending on the technology in use. Some MFC solutions supplement automated picking of ambient and chilled items with manual picking of frozen items, and even manual pallet picking of fast moving items
<b>TYPICAL AUTOMATION</b>	ASRS and cASRS systems, conveyor networks, and more recently robotic picking solutions and supplementary automation	ASRS and cASRS systems with minimal to no conveyor systems



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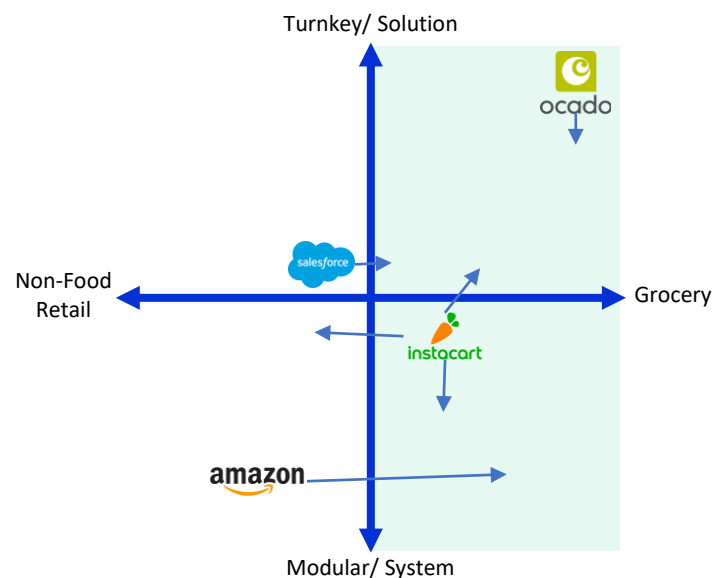
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# THE PANDEMIC PUSHED E-GROCERY INFRASTRUCTURE SECTOR INTO A FLURRY OF ACTIVITY WITH NEW PRODUCTS, SERVICES. NEW COMPETITORS EMERGING

## E-GROCERY INFRASTRUCTURE LANDSCAPE



Source: STIQ Research & Analysis. Sample vendors only

## E-GROCERY INFRASTRUCTURE STATE OF FLUX

- Analysis of the interviews for this report seemed to point to a sector in a state of flux
- Multiple new vendors were emerging and automation solutions changing in size, configuration, etc.
- For example, in 1Q22 Ocado Solutions announced they would offer a headless option, effectively introducing a level of modularity to their turnkey solution
- Many e-Commerce platform vendors accelerated e-Grocery platform developments during the pandemic

- Whilst its wider e-Grocery ambitions as a solution provider are unknown, Amazon launched its Just Walk Out technology in 2020 to external grocers
- Instacart has been trying to make sense of its unprecedented success during the pandemic and appeared to subsequently be moving in all kinds of directions
- One of the consequences of Instacart's success appeared to have been an increased demand for e-Grocery Platforms and data acquisition tools

## E-GROCERY REMAINED NASCENT

- The e-Grocery channel remained nascent despite some grocers having offered groceries online for more than two decades
- The result of slow growth and many grocers developing internal products has been a lack of mature products and services on the market
- As a consequence, the market experienced continued and widespread experimentation among grocers
- A key driver for this was to induce profitability for most grocers and for a few also to improve profitability

## GROCERY EXPERIMENTATION

- This section highlights some areas of experimentation, such as:
  - Increased digitalisation of store environments
  - Data collection
  - ROI & Profitability of the e-Grocery channel
  - Merchandising & product assortment strategies
  - Shared delivery

## DATA OWNERSHIP

- Customer data ownership (and traffic) can be an important source of additional revenue streams
- **“Owning the customer data, putting that customer name to data, grocers can monetize the eyeballs for digital dollars... retail media is growing more and more important.” [Brick Meets Click]**
- For example, in 2022 Amazon revealed a massive \$31.2bn in advertising revenue alone ([source](#))
- Online and increasingly digitalised store environments offered an opportunity for Legacy Grocers to drive additional revenue streams Instacart appeared to have had a profound impact on grocers and may have inspired wider data collection initiatives
- Marketplaces typically retain all rights to data captured and only share limited information with grocer partners

## INCREASED LEGACY GROCER DIGITALISATION

- Research indicated a heightened level of store digitalisation among Legacy Grocers
- **“In the late 90s and early 2000s there was a big digital transformation drive. We're now in this transition period where we have a transformation from traditional retail to e-Grocery... and we're right at the beginning of that, it feels like it's been around for a long time, but it really hasn't.” [FoodX]**

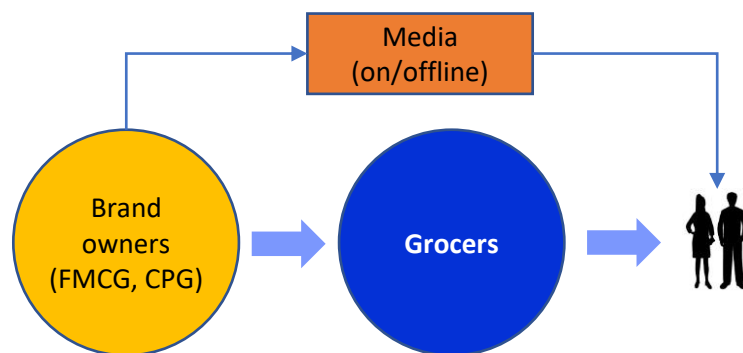






# DATA OWNERSHIP CAN PROVIDE ADDITIONAL REVENUE STREAMS AND OTHER BENEFITS

## SIMPLISTIC FMCG/CPG & GROCER RELATIONSHIP



Source: STIQ research & analytics

## MIXING ON & OFFLINE DATA

- Legacy Grocers should be able to monetize their data better than any competing business model as they have access to omni-/multi-channel data
- “Instacart showed grocers how to monetize data. But I think retailers should be able to do it better than Instacart, because if you mix the data you already have from your store customers from loyalty card data... you can marry that with the very rich online data that you get, I think you could make a potential and very efficient advertising tool for CPG's and also for yourself as a retailer to target your own customers. I think grocers are at the start of the learning curve of how to monetize their own customers instead of letting someone like Instacart doing it for them. And at the same time, some are bringing fulfilment in house, which they can do much more efficiently than Instacart.” [TPG]**

- Interviews also suggested grocer media networks are forming that may take advantage of omnichannel data
- “We are arguably the largest in store media platform in the world at this point with >90 million monthly consumer traffic in front of our screens...CPG brands is a primary customer. Brands invest in the media and we have a revenue share model with the retailers.” [Cooler Screens]**
- ## OPTIMIZATION OF THE ONLINE EXPERIENCE

- Interviews suggested there was more work to be expected in how grocers and FMCG/CPG brands optimise the online experience
- “CPG brands just do not have the data for online performance at the moment, and it's not particularly transparent. Why would you as a retailer share that data with the brands? So we end up seeing quite an opaque view for online including images, etc. and people can't really test in a proper way... so the CPG brands can't do a big test to work out which images work best, etc.” [VST]**
- However, new experimental testing methodologies may be developing to allow FMCG/CPG brands and grocers to collaborate on optimising media
- “We do a lot of shelf testing in store. But actually, where we finally got around to... and it has been on the road map for a little while, is essentially to be able to say what if we take that same AB testing methodology but apply it within a virtual environment?” [VST]**

## IN-STORE DIGITALISATION, MEDIA NETWORKS



Source: Cooler Screens. Animated fridge doors

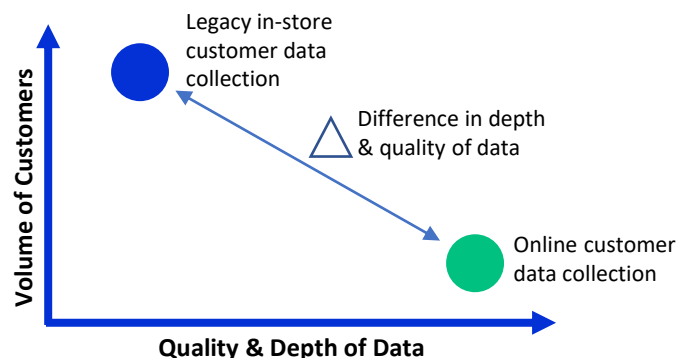
- And, what will the online grocery customer journey look like in 5 years?
- “The bigger piece from me is where we really want to go next, in terms of e-Commerce, grocery and metaverse grocery shopping and all the rest of it... Why are we kind of replicating this thumbnail view of e-Commerce across every single grocery retailer... if you type in Coca Cola you see a series of thumbnails of these products pop up with a price and not much else on there... but as humans we're not particularly well trained to make our decisions like that and therefore we don't see enough new, or alternative products within e-com environments” [VST]**





# AUTONOMOUS STORE & OTHER TECHNOLOGIES CAN OFFER A THICKER DATA COLLECTION LAYER FOR LEGACY GROCERS THAT MAY PARTLY SOLVE INVENTORY ACCURACY PROBLEMS

## CUSTOMER DATA COLLECTION DELTA, ON VS OFFLINE



Source: STIQ Ltd research & analysis

## IN STORE VS ONLINE DATA CAPTURE

- The wider availability of data points online far outweighs anything that grocers have been able to capture from stores

**“Online there is so much data about the customer, what they ordered, what they looked at, what they put in the basket and then took out, what was too expensive and so on. But, in most physical stores today, you have nothing of that.” [Anonymous]**

- There are numerous technologies available for Legacy Grocers to capture data in-store
- One emerging technology is Autonomous Store technology that is increasingly deployed in larger and larger stores

**“We have deployed in a c.6,500 sqft in London, UK which is actually our largest deployment... and it's actually the largest autonomous store in the world... solely powered by cameras in the ceiling. There are larger Amazon Fresh, but they are also powered by more expensive equipment like shelves... gravity sensors, etc.” [AiFi]**

**“Currently our biggest stores are around 250 sqm. We also have bigger stores that are closed to the public and we're going into even larger by early 2023. Our customers have big stores. Our aim is definitely to start with the small stores heading towards bigger stores.” [Anonymous]**

- Whilst some grocers are actively rolling out autonomous stores, others are trialling the technology and trying to understand advantages

**“At this stage you have a number of very bullish retailers that are already rolling out autonomous store technologies, but a lot of them also are trying to understand what are the advantages that this technology can have for their business.” [Sensei]**

## OTHER DATA CAPTURE TECHNOLOGIES

- In-store planogram compliance has been very important for FMCG/CPG companies as a part of commercial deals with Legacy Grocers

**“We've seen a lot of demand for planogram compliance coming from the CPG brands for in-store execution, especially when they run some campaigns.” [Neurolabs]**

- This is increasingly also important for grocers when fulfilling online orders in-store

**“We're working with grocers and FMCG players with our product location capabilities and assisting grocers in updating their consumer mobile applications and in-store pick & pack operations....they're using our data to enhance end customer throughput by adding accuracy on where things are on shelves so they can speed up and improve their e-order fulfilment processes.” [Badger Technologies]**

- Product location data was increasingly important, not only to Legacy Grocers, but also to marketplaces offering pick & pack services for Legacy Grocers
- Some marketplaces had deployed data capture technologies to map out Legacy Grocers inventory

**“We provide our navigation technology to a few leading grocers. Our technology updates the location for where a particular SKU is picked.” [Orient]**

- When planograms are not used, other technologies, such as Pick to Light may be deployed by legacy grocers

**“Our digital on shelf labels have pick-to-light functionality for in-store or dark store pickers to get a flashing light notification where to pick.” [SES Imagotag]**





# DESIRE FOR IMPROVED E-GROCERY PROFITABILITY CAUSING MUCH EXPERIMENTATION. MERCHANDISING STRATEGIES AFFECTING ROI

## MODEL FLEXIBILITY & ROI OF AUTOMATION

- Interviews suggested grocers are running multiple pilots, tests and experiments

“Everyone is playing with their model at the moment trying to find the sweet spot. The clear split between a CFC being gigantic and the MFC being tiny was fine theoretically. Now there is something in the middle and bigger CFCs and smaller MFCs which are morphing into... kind of any size will do, depending on demand... I think the big thing they're trying to understand is the uptake by the population. In my mind it is trying to see where the demand is coming from. What is creating additional demand to have those kind of sub-two hours deliveries? I mean, that's a new thing for everyone and trying to understand the uptake and basically just coming direct, the size...” [Anonymous]

- There appeared to be a heightened flexibility with ROI for MFCs and automation equipment

“The ones [grocers] that I've seen have been a bit more flexible and strategic with ROI. Obviously they see it as strategic... there's an R&D element to it and the more forward looking grocers are saying we want to get there first because we're going to prove the way... so we'll have a bit of an edge on this. There is a willingness I've seen to take a slightly more strategic look. Obviously there's a minimum level and it's got to be positive... you're not going to go in something and you've got to be able to see a path to improvement. But yes, strategic flexibility is definitely there.” [TPG]

- There was also a curiosity angle to MFCs and other new technologies on the market
- Early adopters may want to keep an edge on the competition by adding and learning about these systems

“I would say most of our clients may be thinking about it as a curiosity rather than a real business case. I don't think the business case for an MFC, with the Capex... that the ROI is there. It doesn't make a lot of sense in Latin America as of today as salaries are comparably lower.” [Instaleap]

- The US appeared to remain the leading destination for MFCs

“We're seeing a progressive amount of these conversations going on in Europe about doing things, but we're not seeing massive rollouts of these things [MFCs]. It's a lot of technology that is driven out of North America.” [Gillespie Manners]

- The current lack of action on MFCs in Europe was largely unexplained, but might be related to size of stores and that the early adopters have already done e-Grocery for the best part of two decades

## GROCER'S CUSTOMER PROPOSITIONS

- Interviews suggested the customer proposition was at the heart of any automation discussion

“One of the things that we're seeing a lot more is the variation in requirement from customers. This is about how they're differentiating themselves... the margins are so thin that you don't do it on product. You do it on your customer proposition... on service, on time, on cost.” [Swisslog]

- This also indicated a wider flexibility with standard ROI calculations

## MERCHANDISE EXPERIMENTATION

- Another area receiving significant focus and experimentation by grocers was online merchandising and assortment strategies

“One way to overcome the margin loss or the thin margin in groceries online is to diversify... to make sure they can sell other higher margin merchandise like prepared meals, accessories etc. on their website.” [Orchestra]

“Assortment is probably the newest piece that people are trying to unravel. I think it's probably the biggest area for improvement.... improving the octane of the fuel of the system. We've been working with a number of data suppliers trying to get some models around approaches that would address seasonality, promotions of store locations, etc. To try to make sure that we optimize that. And then you have to look at what their supply chain looks like... if refrigerated is delivered every two days, you may have to have more days of supply and then for dry which is delivered every day. There's multiple warehouses that supply it, so that could be a consideration about how many days of supply, etc. A lot of this is yet to be finalized, and models are yet to be built around getting the assortment right in the automation system.” [Alert Innovation]

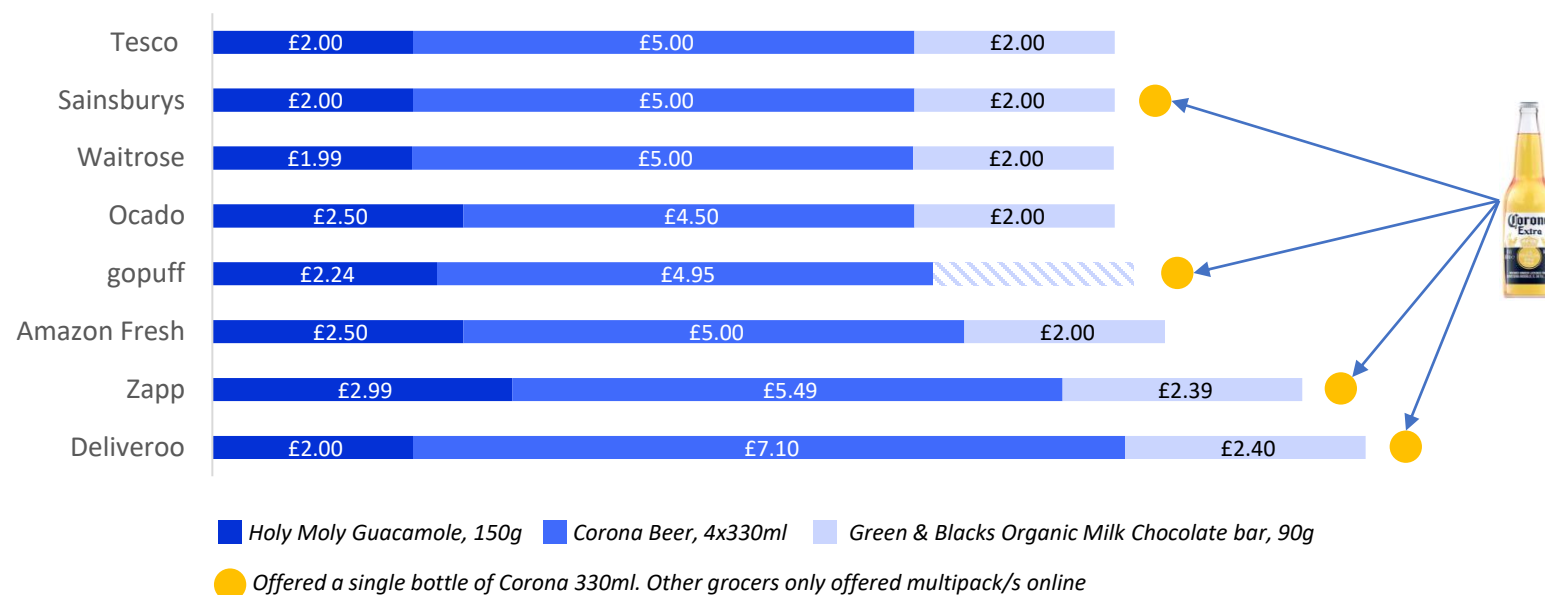
“Merchandising online is very important. For instance, how to sell impulse items online to drive incremental sales and improve the margin mix.” [TPG]





# ROI CAN BE INFLUENCED BY MANY DIFFERENT FACTORS, SUCH AS PRODUCT ASSORTMENT, PRICING, MERCHANDISING, SHIPPING, ETC.

BRITISH ONLINE GROCERY PRICING COMPARISON, APRIL 2022 (£)



## MERCHANDISING STRATEGIES

- Merchandising was also different between grocers and business models
- For example, all grocers offered the Corona Beer pack of four 330ml bottles, but only half of grocers offered a single bottle
- All of the Q-Commerce & food delivery companies (Gopuff, Zapp and Deliveroo) offered a single bottle
- Sainsburys was the only Legacy Grocer that offered a single bottle
- Grocers acknowledged a significant level of merchandising and assortment experimentation

**“The COVID-19 pandemic continues to challenge and change the retail landscape, particularly relating to consumer shopping preferences, a focus on value, healthy eating, and the overall channel shift from in-store to online purchasing. Traditional and non-traditional retailers have responded by adjusting product assortments, pricing and promotional offerings; focusing on the health and safety of consumers; and ramping up investment in home delivery or click-and-collect capabilities. Inflation and increasing prices have further challenged the retail landscape in 2021.” [Ahold Delhaize, p48, AR 2021]**

## IS ONLINE MORE THAN JUST ONLINE?

- Loyalty programmes or savings schemes were used in the 1950s but some of the first proper loyalty cards appeared in the 1990s ([source](#))
- Loyalty data has become a key part of the value grocers provide to suppliers and partners
- Some grocers have created ‘super apps’ including loyalty, online shopping, shopping lists, and other services, such as banking and mobile phones

Source: STIQ Ltd Research & Analysis. Excludes analysis of any additional service and/or delivery costs

Note i: Prices for online goods in the UK as of April 27, 2022 @ 13-14:00

Note ii: Loyalty and volume discounts did not apply. If applied, Tesco would be cheapest at £8.00 in total (using Clubcard), followed by Sainsbury’s at £8.50

Note iii: gopuff did not offer Green & Blacks Milk Chocolate Bar at time of checking

Note iv: Deliveroo is a delivery service and quoted prices were from a variety of grocers

## PRICING STRATEGIES

- STIQ performed a temporary and very limited price & merchandising check across eight grocery outlets in the UK in April 2022
- The purpose of this was to perform a spot-check to determine differences between various grocers and business models

- On the whole, it appeared that Legacy Grocers adhered to a lower price level whilst Q-Commerce players and food delivery companies used a higher price point
- Using grocers’ loyalty schemes improved prices and, when applied, the best value in price check was provided by Tesco, followed by Sainsburys





# GROCCERS TRIALLING SHARED DELIVERY INFRASTRUCTURE. MIXING DATA SOURCES ON AND OFFLINE

## SHARED DELIVERY INFRASTRUCTURE

- Many grocers operate their own delivery fleets and have increasingly also experimented with using 3<sup>rd</sup> parties for faster or different delivery missions
- These 3<sup>rd</sup> party delivery companies typically only deliver goods from one retailer at a time
- Just before publishing this report there was an interesting development in Paris, France where multiple grocers had started using the same locker network

**“We have just launched what we believe is the world's first multi grocer delivery network with our Delipop pickup network in Paris. It is fully automated and serves Carrefour and Monoprix ... yes, from the same shopfront. We had to do a lot of work with the interface. This is very exciting.” [Retail Robotics]**

## BRANDING MORE IMPORTANT THAN PROFIT?

- In STIQs 2021 report, it was suggested the reason for grocers to operate their own delivery networks was due to branding & marketing potential
- Interviews appeared to suggest profitability of the locker model was at the heart of the proposition

**“It was not easy to persuade grocers to share a delivery option, but of course they all are looking for profits. So if you show them profits and if they can share the costs, this is most important point. But there is more... Of course we needed to present them with UX guiding their consumers with their brand from the window display and entrance - through the whole process on the screen to the final pickup.” [Retail Robotics]**

## Q-COMMERCE DARK STORE FULFILMENT LOCATIONS



Image Source: Retail Robotics

- STIQ posed the question if this development may be one of the first moves towards an agnostic van delivery network?

## LOCKERS AS EXPANSION TOOLS

- Interviews suggested ambulatory lockers could also allow grocers to access new customers or use such lockers as tools to expand their audience

**“One of our customers in Denmark is testing the idea of having the pickup up somewhere else other than the store, so they are kind of multiplying their locations without even adding stores.” [Cleveron]**





# EXPERIMENTATION OVERLAPPED WITH BUSINESS MODELS. Q-COMMERCE INFLUENCE ON THE WIDER E-GROCERY INFRASTRUCTURE SECTOR

## Q-COMMERCE DARK STORE FULFILMENT LOCATIONS



Image Source: Authot's own image from Getir in central Boston (MA), US

- For example, one way some Q-Commerce players have circumvented planning permissions is to allow “walk-in” customers (see image)

## UNINTENDED CONSEQUENCES

- In 2022 some cities in the Netherlands, Amsterdam & Rotterdam authorities also prohibited the opening of further dark stores by Q-Commerce companies
- However, such criticism went beyond Q-Commerce players and appeared to have targeted at any company wanting to start localised grocery operations
- This included click & collect points, such as automated locker operations

**“Some cities declared war on the Q-Commerce companies... and at some point they started to perceive us as dark stores. We need to show the administration we are different. It's for consumers to pick up their goods, you can enter the location, it's good for the environment and for the local society, and so on. We managed to convince them, but it took us almost half a year to do so everything was delayed.” [Retail Robotics]**

## FUTURE COMPETITION

- STIQ viewed the many different startups from Q-Commerce to Meal Kit and beyond as potential disruptors in the e-Grocery Infrastructure space
- The reason for this is that many of these companies have raised significant amounts of money and have developed fairly sophisticated software packages for e-Grocery

- As commercial pressures increase on these companies one potential revenue stream may include attempting to monetise internal software platforms
- Plus a few vendors started with a different business model to the one they currently offer

**“Our first approach in 2015 was a marketplace business model, like Instacart, across Colombia and Mexico. We were an operator whose sole business was getting stuff delivered to your house in less than an hour. As we were doing that, what we started hearing from retailers was that the marketplace thing is good, but we're afraid of losing the data, losing the customers, we want to control the strategy... we would love to be able to access that same kind of technology but not as a marketplace, but as a real owner of the e-Commerce channel. And that's how we launched our e-Grocery platform for grocers in 2019.” [Instaleap]**

- However, some vendors disagreed with STIQs hypothesis **“We don't see Q-Commerce players as potential competition. It's a different use case... I mean the baskets are generally smaller and the shopper tends to have a different mission when purchasing a product. I know Instacart is repositioning themselves more like a platform vendor... they're becoming more of a competitor in terms of the solution positioning.” [Mercatus]**
- In 2022, Deliveroo began offering a software stack for pick, pack & delivery to partners ([source](#))

## NEW BUSINESS MODELS

- This report does not focus on the Q-Commerce segment, but the fast rise of the sector has impacted the wider e-Grocery Infrastructure sector
- Multiple grocers have partnered with Q-Commerce companies to offer faster delivery options

**“We talk to retailers who cooperate with Q-Commerce players... and they say we know it's not going to survive, but at the moment we need to show that we are moving forward...” [Anonymous]**

## CRITICISM OF THE Q-COM BUSINESS MODEL

- The Q-Commerce business model has been criticised by many city authorities as players increasingly focused on Dark Stores to fulfil orders
- A key part of the criticism has focused on the increased traffic and often apparent misuse of planning permissions ([source](#))





# MARKETPLACES APPEARED TO HAVE DISRUPTED THE STATUS QUO FOR LEGACY GROCERS AND HAVE PROVEN A FERTILE GROUND FOR E-GROCERY INFRASTRUCTURE VENDORS

## THE PANDEMIC HOISTED INSTACART

- Instacart is primarily a North American phenomenon that allowed non-online grocers to kickstart their online operations during the pandemic

**“Instacart is the king of the hill... for today, and I give them a lot of credit for that. They enabled a lot of retailers to go online during Covid. But as it has become a larger part of the business it was inevitable a conflict would rise. Because retailers will look at how they can mitigate rising costs... We've seen a lot of retailers walk back to monthly contracts. At first it would have been a one year, then it would have been a multi year. We even have a few talk privately that when their contract expires they will not renew it. It's not to say they will leave Instacart. It's just that Instacart's role is changing.”** [Brick Meets Click]

- As pandemic effects are subsiding, grocers have been given time to rethink their relationship with marketplaces and where best to deploy them

**“We have started a conversation with a grocer for their curbside pickup, because a lot of the retailers are also stuck in the Instacart wave... We try to provide a system for grocers to do their own pick & pack and curbside delivery.”** [Anonymous]

**“Many of these 3<sup>rd</sup> parties emerged in the US pre-Covid and then just took off because many grocers hadn't adopted online. These grocers just jumped on all of these 3<sup>rd</sup> party platforms, not thinking they were losing all that data. The talk of the town is now how do we recapture that data?”** [OSF Digital]

- Marketplaces often provide the full infrastructure required to fulfil online orders

**“You're paying Instacart for their service... They conveniently provide you with in-store pickers, workflows, delivery service integration that you did not have etc. So, it does provide some value, but in the long run, it's not positive for grocers. They lose control over their image, their brand and more importantly their customers.”** [Orchestra]

## MARKETPLACE LIMITATIONS

- Grocers that used marketplaces exclusively may have realised the limitations

**“We've found opportunities where retailers have been fully dependent on marketplace solutions like Instacart. They are at a minimum starting to diversify... not necessarily in all cases saying we don't want to work with Instacart, but wanting to have some control to manage their own business while still being on the marketplace.”** [Grocerkey]

**“One of our customers were already online with Snappy Shopper. It's a bit sensitive because they want to move away from Snappy Shopper... because of the data problem. The marketplace owns the data, owns the customer and retailers have limited access to that.”** [Anonymous]

**“I think grocery retailers have smartened up fast since Covid and they're not afraid now to start to consider owning the online experience more on their terms... There are at least two major retailers that are planning to eventually delist off marketplaces. Another one is going with another national delivery provider, not Instacart, simply to diversify and take advantage of the diversification in the marketplace arena.”** [Mercatus]

## THE LOYALTY ASPECT

- Many Legacy Grocers have large loyalty programs in place they may be able to leverage to regain customers from marketplaces

**“There continues to be strong brand loyalty in the grocery space that we don't experience in many other retail sectors, built largely on the back of incredible private label offerings and points programs. Instacart and other 3<sup>rd</sup> Parties really disrupt that loyalty cycle by intercepting the customer with an immediacy value proposition, and I think that's what is driving some of the e-Commerce responses that we've seen. Some retailers see the integration & partnership with these third party services as an avenue to quickly tap into additional market share, whereas others may say look my store is my experience, I want to control and own it.”** [Dematic]

- 3<sup>rd</sup> party marketplaces have offered a strong service and continue to evolve to stay relevant making it increasingly difficult for grocers to simply turn off the channel

**“Leaving a 3<sup>rd</sup> party platform is increasingly difficult because they are adapting very quickly and adding new services constantly. The key differentiator grocers have is their loyalty programs. Usually grocers have some loyalty program where you gather points and you have access to specific promotions for your area or your shopping habits. So they are betting on that... And we have also seen some grocers starting to experiment with Prime kind of offerings, free delivery or special promotions. But even if the intent is to move away from these third parties, we see it is being approached cautiously and step by step, not simply killing a revenue channel.”** [OSF Digital]





# INSTACART IS IN NEED OF A BOOST TO ITS IPO PROSPECTS. BUT WILL THEIR VIEW OF THE FUTURE OFFER COMPELLING COMPETITION TO OCADO... OR AMAZON?

## INSTACART, ASTONISHING GROWTH

- Instacart (Maplebear Inc.) remained a key player in the North American online grocery market
- The few numbers released publicly by the company have been astonishing
  - Instacart were on track to process \$35bn GMV in 2020 ([source](#))
  - Instacart accounted for 50% of online grocery growth in the US in 2021 ([source](#))
- However, whilst highly impressive, most numbers were indicators rather than actuals

## THE VALUE OF INSTACART'S DATA

- Instacart vastly accelerated its data collection during the pandemic and grew its customer database
- Whilst such data is intrinsically valuable to advertisers, STIQs view is that some of the purchasing behaviour data may be skewed towards pandemic buying patterns

## INSTACART, FABRIC & MFCs = FABCART?

- In early 2021, rumours circulated about Instacart looking for a fulfilment centre partner and that they had talked to every vendor in the market
- In July 2021, Instacart announced a multi-year agreement with Fabric ([source](#)) to roll out automated fulfilment centre technology ([source](#))
- The reason Instacart selected Fabric may have been reductive as most other vendors reported very long lead times to deploy automation
- Fabric's business model has mainly been to act as a 3PL with automation included and may not have suffered from extensive lead times experienced by other vendors

## INSTACART, BIGGER PLANS FOR RETAIL?



Image Source: Instacart/Maplebear

- In March 2022, Instacart announced they would be building a number of fulfilment centres and bundle services to grocers

**“The warehouses will be part of a bundle of services — including advertising, data insights and in-store tech such as “smart” trolleys — known as Instacart Platform.”**  
[\[Instacart via FT.com, source\]](#)

## THE INSTACART IPO

- One of the most asked questions in recent years has been when Instacart will IPO, and in May 2022 the company finally announced their intention to file for a public listing ([source](#), [source](#))
- However, the timing may not be optimal considering geopolitical events and inflationary pressures
- In March 2022, Instacart cut its valuation by 40% from \$39bn to \$24bn ([source](#))

## INSTACART M&A

- Instacart had raised at least \$2.9bn ([source](#)) from investors by the end of 2021
- Part of the money raised had been deployed for acquisitions
  - 2015: Wedding Party (US, n/a)
  - 2018: Mightysignal (US, n/a), Unata (CA, n/a)
  - 2021: Foodstorm (AU, n/a), Caper (US, \$350m)

- Instacart's acquisition of Caper was significant and hinted of an ambition to build & offer a larger operating system for grocers and other retailers

## STIQ'S VIEW OF INSTACART

- Instacart is a very impressive business that was at the right spot at the right time when the pandemic hit
- The partnership with Fabric makes sense as both companies are in need of positive PR to boost potential public listings/divestment opportunities
- However, the partnership appeared to be focused on allowing grocers threatened by Kroger's partnership with Ocado Solutions a way to potentially fight back
- For example, deploying MFCs in Florida together with Publix may be a way for Publix to return fire in the fight over online customers
- But this seemed more like a 'sticking plaster' solution for Publix rather than part of a more coherent strategy
- The e-Grocery Infrastructure market would likely welcome a challenger to Ocado Solutions, but Instacart will have its work cut out if this is their ambition — Ocado has been around for 20+ years
- Instacart may need a bit more creativity in their view of the future of grocery shopping, potentially acquiring a “grab and go” solution and a few others to create a proper ecosystem to rival the likes of NCR, Mitsubishi, etc.
- **STIQ welcomes your views on this – email us at [tom@styeintelligence.com](mailto:tom@styeintelligence.com)**







# AMAZON HAVE BEEN ACTIVELY PROMOTING ITS IN-STORE TECHNOLOGIES RECENTLY. IS 'JUST WALK OUT' A PRECURSOR FOR AN E-GROCERY OFFERING?

## AMAZON AT TRADE SHOWS

- In recent years, Amazon (AWS) have proactively released solutions for the wider market
- For example, STIQ covered "AWS Robo Maker", a robotics simulation tool released in 2021
- In 2022, AWS promoted the "Just Walk Out" technology at various retail tech trade shows in the UK

## AWS EDGING TOWARDS A GROCERY OS?

- Amazon is always experimenting and testing new solutions and second-guessing what they may do is always fraught with a large dose of uncertainty
- However, the fact that AWS are actively offering Just Walk Out technology appears to indicate a wider B2B offering may be on the cards
- Some of the current technologies by AWS targeting grocers include:
  - Amazon Go/ Just Walk Out [\[link\]](#)
  - Amazon Dash Cart [\[link\]](#)
  - Amazon One [\[link\]](#)

## AWS JUST WALK OUT

- Justwalkout.com was registered in 2013 and the first Amazon Go 'beta store' using Just Walk Out technology was constructed in 2015 ([source](#))
- The first public Amazon Go store opened in 2018
- In 2021, Amazon signed up its first commercial customers, Sainsburys in the UK, for its Just Walk Out technology solution ([source](#))
- In Jan 2022, Amazon showcased the technology at NRF [\[link\]](#) in New York and in April 2022 it exhibited at the Retail Technology Show in London, UK [\[link\]](#)

Note: Amazon launched "Store Analytics" just before publication of this report ([source](#))

## BIGGER PLANS FOR GROCERY RETAIL?

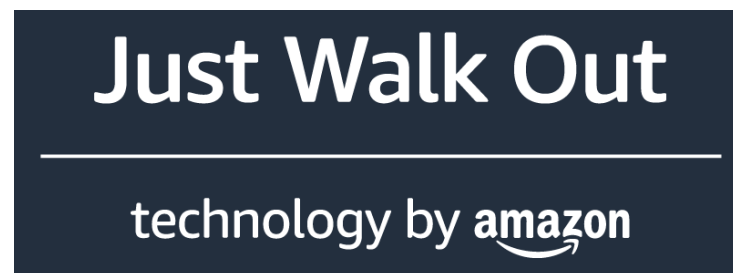


Image Source: Amazon

- At the time of writing this report, JWOS (Just Walk Out as a Service) was recruiting c.200 staff on Amazon.jobs

## AMAZON DASH CART

- The Dash Cart is currently only available in Amazon Fresh stores
- Dash Cart includes a product scanner and sensors which let you know if you have added an item without scanning it successfully
- This type of improved checkout exists in various formats in many different shops



## AMAZON ONE

- Amazon One is a cash/cardless payment solution where you pay with the palm of your hand (compare versus a fingerprint)
- This allows a person to check-in to a Just Walk Out enabled store with the palm of their hand (vs the phone app)

## PROJECT SANTOS?

- If rumours are to be believed, it seems Amazon are developing solutions in parallel to Amazon Go, Dash Cart and One
- One of these, Project Santos [\[link\]](#), Forbes] may be a POS solution to compete with Shopify, PayPal, etc. which may also be available as an in-store hardware solution

## STIQs VIEW OF AWS IN GROCERY

- Amazon as a whole view the grocery vertical as a core part of their business
- AWS is providing technologies for some of Amazon's store initiatives
- STIQs view is that AWS will continue to probe the market with new solutions to generate demand and also to determine interest
- However, STIQs impression is also that AWS may have fallen behind and is no longer an innovator, especially in the grocery space



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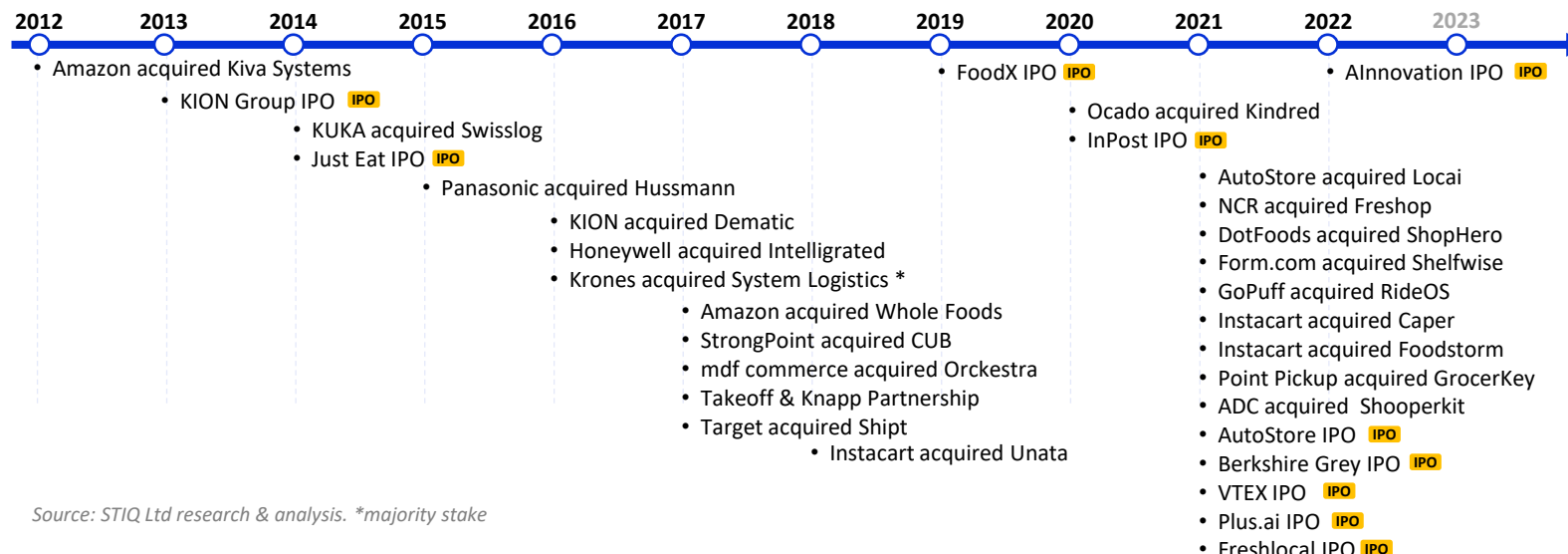
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# THE PANDEMIC SUPERCHARGED M&A ACTIVITY IN 2021. OUTLOOK FOR 2022 LESS CERTAIN

## SELECTED E-GROCERY INFRASTRUCTURE SECTOR TRANSACTIONS, 2012-2021



Source: STIQ Ltd research & analysis. \*majority stake

## DID THE PANDEMIC CAUSE AN M&A FRENZY?

- There is ample evidence to suggest the pandemic opened up additional exit opportunities for investors and caused heightened M&A activity
- For example, there were five IPOs in 2021, 5X more than in any other single year since 2012
- Among the more prolific sector investors, SoftBank exited four companies in 2021 and 2022 (to May 2022); AutoStore, VTEX, Berkshire Grey and Ainnovation via IPOs
- In terms of segments, e-Grocery Platforms were a very popular target in 2021 with at least four known acquisitions
- Interviews suggested M&A in the platform space may continue in the short to medium term

**“There’s probably going to be more consolidation amongst the platform software providers in this space. I think you’re seeing at the smaller level, a desire to punch up into the enterprise space. Those players are going to be hitting a ceiling in terms of their capability to deliver at the enterprise level.” [Mercatus]**

## SIGNIFICANT VOLUME OF PARALLEL M&A

- In parallel to infrastructure player M&A activity, there has been a significant M&A volume by grocers and grocery related businesses, such as food delivery and Q-commerce companies
- Most of this has been done to strengthen the core business rather than an infrastructure play

## M&A ACTIVITY

- STIQ identified >300 companies active in the e-Grocery Infrastructure sector
- These businesses overlap many different sectors and the chart above represents a curated version of M&A activity since 2012
- Note that Ocado floated in 2010, but their impact on wider sector startup and M&A activity was deemed limited at the time
- 2012 was used as a base year to showcase Amazon’s influence in the wider fulfilment automation sector
- System Integrators (SIs) supplying fulfilment automation solutions to grocers and others experienced a consolidation wave in the mid 2010’s

## SYSTEM INTEGRATOR CONSOLIDATION

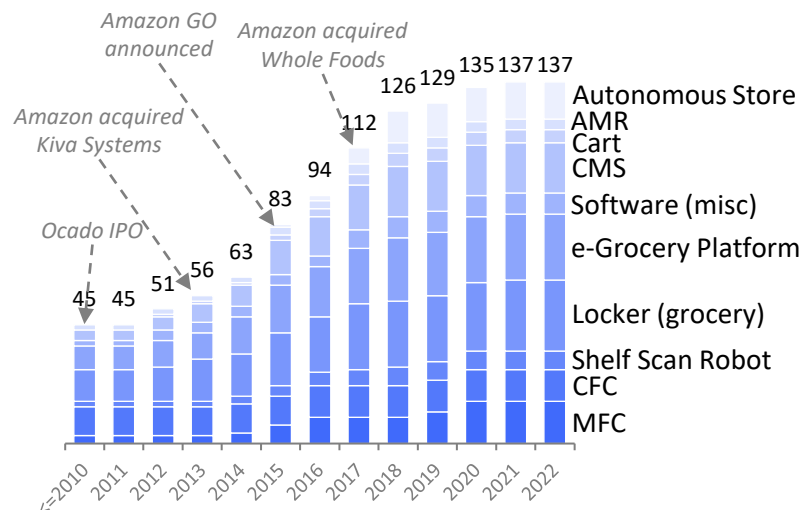
- A primary driver of top SI’s revenue growth since the early 2000’s has been growth in e-Commerce fulfilment infrastructure
- Interviews with leading SIs appeared to hint at a shift in focus towards the e-Grocery sector from 2020/21 to 2022
- There has been significant investments in system integrators in the 2020’s and STIQ expects further consolidation and/or public listings among SIs in the short term
- STIQ expects “the huge potential of e-Grocery fulfilment” to form a key part of investment memorandums in the short term





# AMAZON HAS HAD A DISPROPORTIONATE EFFECT ON STARTUP ACTIVITY IN THE SECTOR

## E-GROCERY STARTUP ACTIVITY BY MAIN PRODUCT, 2010-2022 (#, AGGREGATED)



Source: STIQ Research & Analysis. Company foundation year, may vary from year product launched. Focus on main product range

- Readers should note that Kiva Systems has not knowingly been deployed in a grocery fulfilment process to date, however, similar competing vendors were involved in e-Grocery pilots in the 2020's
- Kiva Systems is a **G2P Solution** (download STIQs free G2P Solution reports [here](#)) and many of these solutions can and have been adapted to e-Grocery fulfilment as demand has increased; the primary difference is operating with additional temperature zone/s
- Note that few of the companies covered in this report target the e-Grocery sector exclusively
- For grocers, the main impact was when Amazon acquired Whole Foods in 2017

## FUNDRAISING

- The majority of the companies that were covered in this report and fundraised, primarily raised funds for their non-food e-Commerce activities
- STIQ expected that this trend changed somewhat from 2021 onwards
- Venture funding kicked off in 2015/16 and increased every year to date
- Funding accelerated sharply between 2019-2021
- In addition to increased funding inflows, there was also a significant increase in M&A during 2021
- 2022 fundraising figures covered part of 1H22 and were expected to increase further, despite inflation and geopolitical instability

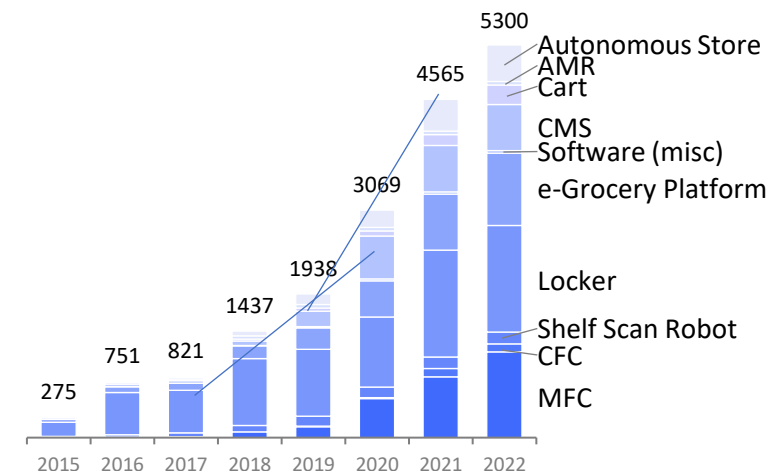
## SECTOR GROWTH & ACCESS TO TALENT

- Significant inflows of funding and sharp growth in the e-Grocery sector during the pandemic has led to an issue with access to talent for vendors as well as grocers

## AMAZON, OUTSIZED STARTUPS INFLUENCER

- The number of companies in the e-Grocery Infrastructure sector increased by 3X from 45 in 2010 to 137 in 2022
- STIQs view is that the primary influence on the significant sector startup activity has been Amazon
- A few key events, such as Amazon acquiring Kiva Systems in 2013 and announcing Amazon Go in 2015 appeared to have sparked a significant number of startups to target the sector

## E-GROCERY FUNDING ACTIVITY BY PRODUCT, 2010-2022 (\$m, AGGREGATED)



Source: STIQ Research & Analysis

Note: Funding to May 2022, by primary product. Will differ from data by founding year

**“Grocers are now competing for digital marketing talent trying to build the online department. And it's been a challenge for them to get up to speed quickly. During Covid you saw that really become a focus... that hiring of talent. And now they're trying to figure it out, it's not as simple as just plugging in an e-Commerce engine. You need to have something that's going to power everything from your inventory to your customer service to your loyalty program to your marketing.” [OSF Digital]**



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## 1Mrobotics

W in cb > WA

**IL | 2020 | -**

- Stealth

## Addverb

W in cb > WA

**IN | 2016 | SG,US**

- Provides an ASRS solution

## Afresh

W in cb > WA

**US | 2017 | -**

- Provides software for managing fresh products

## AiFi

W in cb > WA

**US | 2016 | -**

- Provides an autonomous store solution

## aisle 3


W in cb > WA

**UK | 2020 | -**

- Provides an online comparison engine for consumer products


## Alert Innovation

W in cb > WA



**US | 2016 | -**

- The Alphabot system is designed to address the unique challenges of fulfilling e-grocery orders profitably, quickly and accurately. It is supported by 25+ years of patented design and a dynamic product roadmap to deliver years of additional value to grocers .
- Food safety, product quality and freshness for maximum shopper satisfaction are achieved through 3 temperature zones for item and completed order storage.



Contact John Hennessy at:  
[John.Hennessy@alertinnovation.com](mailto:John.Hennessy@alertinnovation.com)

- No single point of failure and high reliability at low cost are achieved through a passive structure where the omnidirectional robots are the only moving part.
- 10 minute order completion and labor saving from automated order dispense is possible due to fully integrated order storage in all temp zones.
- The lowest labor costs are achieved by order throughput levels that are 8 to 10x manual order fulfillment.
- Alert Academy and proactive monitoring for ongoing reliable operation.

## Amazon (Just Walk Out)

W in cb > WA

**US | 1994 | Global**

- Provides an autonomous store solution

## Anycart

W in cb > WA

**US | 2018 | -**

- Provides an e-Grocery Platform

## Applied Data Corp

W in cb > WA

**US | 1989 | UK**

- Provides a pick & pack solution

## Attabotics

W in cb > WA

**CA | 2015 | -**

- Provides an ASRS solution

## AutoStore

W in cb > WA

**US | 1995 | US,DE,FR,UK,JP**

- Provides an ASRS solution

## HOW TO READ PROFILES

W in cb > WA

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- > = YouTube profile
- Wa =warehouseautomation.co.uk profile
- Microphone = interviewed



# VENDOR PROFILES: A-E



**AWH Tech**

W in cb WA

**US | 2016 | -**

- Provides an inventory solution

**Badger Technologies**

W in cb WA

**US | 2018 | -**

- Provides a shelf scan mobile robot (in-store)
- Customers: Woodman's Markets, Stop & Shop

**Berkshire Grey**

W in cb WA

**US | 2013 | -**

- System integrator

**Bossa Nova**

W in cb WA

**US | 2005 | -**

- Provides a shelf scan mobile robot (in-store)

**Bringg**

W in cb WA

**IL | 2013 | US,UK**

- Provides a routing optimisation solution

**Caja Robotics**

W in cb WA

**IL | 2014 | US**

- Provides an AMR Shuttle solution

**Cleveron**

W in cb WA

**EE | 2007 | -**

- Provides locker solutions
- Customers: Zara, Bilka

**Cloudpick**

W in cb WA

**CN | 2017 | -**

- Provides an autonomous store solution

**Colib**

W in cb WA

**FR | 2016 | -**

- Provides a locker solution

**Cooler Screens**

W in cb WA

**US | 2017 | -**

- Provides in-store advertising screens on fridge doors

**Covariant**

W in cb WA

**US | 2017 | UK**

- Provides a picking robot solution

**Cust2Mate**

W in cb WA

**IL | 2016 | -**

- Provides a cart solution

**Dematic**

W in cb WA

**Atlanta, GA, USA | 1819 | Global**

Dematic designs, builds, and supports intelligent automated solutions empowering and sustaining the future of commerce for its customers in manufacturing, warehousing, and distribution. With research and development engineering centers, manufacturing facilities, and service centers located in more than 35 countries, the Dematic global network of over 11,000 employees has helped achieve approximately 8,000 worldwide customer installations for some of the world's leading brands. Headquartered in Atlanta, Dematic is a member of KION Group, one of the world's leading suppliers of industrial trucks and supply chain solutions. Please contact us at [info@dematic.com](mailto:info@dematic.com)

**DEMATIC**

**eGrocery**

W in cb WA

**US | 2010 | -**

- Provides an e-Grocery Platform





## Eiratech Robotics



IR | 2004 | -

- Provides an AGV G2P solution

## Emporix



DE | 2015 | -

- Provides an e-Grocery Platform
- Customers: MPREIS, Lieferladen

## Etailgrocer (Navsoft)



IN | 1999 | -

- Provides an e-Grocery Platform

## EXOTEC



FR | 2015 | US,GE,JP

- Exotec is a global robotics company, building warehouse robotic solutions that power some of the world's largest brands : Carrefour, Leclerc, Monoprix, GAP, Uniqlo and Decathlon. The company offers flexible warehouse automation to improve operational economics and efficiency.
  - Exotec's signature solution, The Skypod system, uses robots that can reach a height of 12 meters to enable high-density inventory storage.
  - Exotec increases warehouse throughput up to 5 times with 2-minute response times for all SKUs.
  - Exotec systems are fully modular allowing customers to deploy in a matter of months and easily expand their systems without interrupting production by simply adding robots, stations, or racks.
  - Exotec in some key figures :
    - ✓ More than \$440m in funds raised in 4 series
    - ✓ \$2 billion valuation
    - ✓ More than 60 client sites around the world
    - ✓ 60% of revenues generated by additional projects
    - ✓ Ranked #8 among the Fastest Growing European Company presented by Financial Times
- To know more : [www.exotec.com](http://www.exotec.com)



## Fabric



IL | 2015 | US

- Provides an ASRS solution

## Farmstead



US | 2016 | -

- Provides an e-Grocery Platform

## FoodX Technologies



CA | 2018 | US

- Provides an e-Grocery Platform

## Fresho



AU | 2016 | -

- Provides software for fresh goods management

## Freshop



US | 2014 | -

- Provides an e-Grocery Platform
- Acquired by NCR in 2021

## Geek+



CN | 2015 | US,DE,UK,FR

- Provides an AGV G2P solution

## Grab2Go



EE | 2021 | -

- Provides an autonomous store solution

## GrocerKey



US | 2014 | -

- Provides an e-Grocery Platform
- Acquired by Point Pickup in 2021





# VENDOR PROFILES: G-M



## Growcer (FATbit Technologies)



**IN | 2004 | -**  

- Provides an e-Grocery Platform

## Hanshow



**CN | 2012 | NL,DK,DE,FR,AU,ES**  

- Provides a cart solution

## Homesome



**US | 2017 | -**  

- Provides an e-Grocery Platform

## Imagr



**NZ | 2015 | -**  

- Provides an autonomous store solution

## Instacart



**US | 2012 | -**  

- Provides an e-Grocery Platform

## Instaleap



**CO | 2015 | PT,US,BR**  

- Provides an e-grocery platform

## Instock



**US | 2020 | -**  

- Provides a fulfilment solution
- In stealth mode

## Knapp



**AT | 1952 | Global**  

- Provides an ASRS solution

## Locai Solutions



**US | 2018 | -**  

- Provides an e-Grocery Platform
- Acquired by AutoStore in 2021

## Local Express



**US | 2017 | -**  

- Provides an e-Grocery Platform

## Logistar DSIA



**FR | 1985 | CA,RU**  

- Provides an in-store picking solution

## mdf commerce



**CA | 1996 | US,DK,CN,UA**  

- Provides an e-Grocery Platform
- IPO'd in 2000
- Customers: Aldi UK, Sobeys

## Mercato



**US | 2015 | -**  

- Provides an e-Grocery Platform

## Mercatus Technologies



**CA | 2004 | US**  

- Provides an enterprise-grade, multi-tenant SaaS platform that provides more than 50 pre-built integrations, advanced features, multiple fulfillment options, and an in-house implementation team to ensure eCommerce success.

## MishiPay



**UK | 2015 | IN,DK,US**  

- Provides a pay & go solution



# VENDOR PROFILES: M-Q



### My Cloud Grocer

W in cb WA

**US | 2012**

- Provides an e-Grocery Platform

### Myrmex

W in cb WA

**US | 2015 | GR**

- Provides a tote loading solution

### Naveo

W in cb WA

**FI | 2009 | US,UK**

- Provides an e-Grocery Platform

### Neurolabs

W in cb WA

**UK | 2018 | -**

- Provides an inventory solution

### Noyes Technology

W in cb WA

**DE | 2020 | -**

- Provides an ASRS solution

### Ocado Solutions

W in cb WA

**UK | 2000 | US**

- Provides a turnkey e-Grocery solution
- IPO'd in 2010

### OPEX

W in cb WA

**US | 1973 | UK,IR,FR,DE,CH,AU**

- Provides an ASRS solution

### Oxid

W in cb WA

**DE | 2003 | -**

- Provides an e-Grocery Platform

### Paack

W in cb WA

**AE | 2015 | ES,PT,FR,UK**

- Provides a routing optimisation solution

### Paycon

W in cb WA

**US | 2019 | UA,RU**

- Provides a cart solution

### Phononic

W in cb WA

**US | 2008 | -**

- Provides a cold chain solution

### Pricer

W in cb WA

**SE | 1991 | Global**

- Provides a digital shelf label solution
- IPOd in 1996

### Qudini

W in cb WA

**UK | 2012 | -**

- Provides an orchestration solution for click & collect

### Your Company Name Here?

W in cb WA

**US | 2017 | UK,DE,JP,KR**

- Is your company a vendor of software or hardware to grocers?
- Do you want to be included in this directory?
- Contact us > [tom@styleintelligence.com](mailto:tom@styleintelligence.com)

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- Microphone = interviewed






**RETAIL ROBOTICS (INVESTOR IN DELIPOP)**

W in cb WA



**PL | 1988 | FR**

- Retail Robotics creates delivery infrastructure for pickup. It's Arctan machine is the most efficient click&collect robotic solution. It optimises capacity, decreases cost and increases consumer convenience. The general satisfaction level of service: 4,45/5.
- Delipop, powered by Retail Robotics, is the world's first multi-brand e-grocery pick-up network. It is currently the most sustainable model for the cities – even 91% less CO<sub>2</sub> emissions in the last-mile and 15x fewer km driven by vans. Delipop is based on robotic technology that enables a big hub effect. 1 courier can deliver 200-300 orders daily. Integration of flows of orders from multiple brands makes delivery even more efficient and profitable for retailers. What attracts consumers: proximity, free delivery, great UX, price advantage, wide offer.
- Clients: Carrefour, Monoprix.
- Contact: [julian.kozankiewicz@rrobotics.co](mailto:julian.kozankiewicz@rrobotics.co)



*\* All data provided by the Delipop Report 2022  
"Sustainability in the last-mile delivery of groceries"*

**Salesforce**

W in cb WA

**US | 2017 | Global**

- Provides an in-store picking application
- IPO'd in 2004

**Savoye**

W in cb WA

**FR | 1950 | Global**

- Provides an ASRS solution

**Scanbot**

W in cb WA

**DE | 2011 | -**

- Provides a shelf scanning solution

**SES Imagotag**

W in cb WA

**FR | 1992 | Global**

- Provides a digital shelf label solution
- IPO'd in 2006

**Sensei**

W in cb WA

**PT | 2017 | -**

- Provides an autonomous store solution

**Shophero**

W in cb WA

**US | 2015 | -**

- Provides an e-Grocery Platform
- Acquired by Dot Foods in 2021

**Shopic**

W in cb WA

**IL | 2016 | -**

- Provides a cart solution

**Simbe Robotics**

W in cb WA

**US | 2014 | -**

- Provides a shelf scan mobile robot (in-store)

**Spharos**

W in cb WA

**KR | 1997 | -**

- Provides an autonomous store solution
- Division of Shinsegae I&C

**Spryker**

W in cb WA

**DE | 2014 | US**

- Provides an e-Grocery Platform

**SSI Schaefer**

W in cb WA

**DE | 1937 | Global**

- Provides an ASRS solution



# VENDOR PROFILES: S-V



## Standard Cognition



**US | 2017 | JP,IT**

- Provides an autonomous store solution

## Stor.ai



**IL | 2017 | US**

- Provides an e-Grocery Platform

## StrongPoint



**NO | 2000 | -**

- Provides a locker solution
- IPO'd in 2000

## Swisslog



**CH | 1900 | Global**

- Provides an ASRS solution
- Acquired by KUKA in 2014

## System Logistics



**IT | 1976 | Global**

- Provides an ASRS solution
- Acquired (majority stake) by Krones in 2016

## Takeoff Technologies



**US | 2016 | -**

- Provides an e-Grocery Platform

## TGW



**AT | 1969 | Global**

- Provides an ASRS solution
- Customers: Picnic, Frisco.pl

## Tompkins Robotics



**US | 2017 | -**

- Provides a sortation solution

## Trigo



**IL | 2018 | US,NL,UK,AU,DE**

- Provides an autonomous store solution

## Truno



**US | 1978 | -**

- Provides an e-Grocery Platform

## TUKU



**SG | 1978 | CN**

- Provides overhead conveyors also deployed in-store

## Urbantz



**BE | 2015 | -**

- Provides a routing optimisation solution

## Urbx



**US | 2016 | -**

- Provides an ASRS solution

## V7 Labs



**UK | 2018 | -**

- Provides an autonomous store solution

## Vargo



**US | 1971 | -**

- Provides a WES



# VENDOR PROFILES: V-Z



**Veeve**

W in cb > WA

**US | 2018 | -**

- Provides a cart solution

**VST**

W in cb > WA

**UK | 2016 | -**

- Provides a merchandise shopper testing solution

**VTEX**

W in cb > WA

**US | 2000 | Global**

- Provides an e-Grocery Platform

**WITRON**

W in cb > WA

**DE | 1971 | Global**

- Provides an ASRS solution

**Wynshop**

W in cb > WA

**US | 2018 | UK**

- Provides an e-Grocery Platform
- Acquired by MI9 in 2020, renamed
- Customers: Wakefern, United Supermarkets

**Zielcommerce**

W in cb > WA

**IN | 2015 | -**

- Provides an e-Grocery Platform

**Zipin**

W in cb > WA

**US | 2018 | -**

- Provides an autonomous store solution

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# INTERVIEWEES & CREDITS, TRADE SHOWS, GLOSSARY

## INTERVIEWS - VENDORS:

- AiFi (US) CEO
- aisle 3 (UK) Founder
- Alert Innovation (US) CEO
- Badger Technologies (US) CEO
- Cleveron (EE) CMO
- Colib (FR) CEO & Co-founder
- Cooler Screens (US) CEO
- Covariant (US) Head of Sales
- Dematic (US) Chief Disruptor
- Eiratech Robotics (IE) Head of Marketing
- Emporix (DE) CEO & Founder
- FoodX (CA) SVP
- Grab2Go (EE) CEO
- Grocerkey (US) CEO & Co-founder
- Instaleap (MX) CEO
- Instock (US) CEO & Co-founder
- Knapp (AT) Innovation & Logistics
- Local Express (US) VP Communications
- Mercatus (CA) VP Marketing
- Neurolabs (UK) Co-founder
- Ocado Solutions (UK) Head of Communications
- Orckestra (CA) Product Marketing Director
- Paycon (US) Co-founder
- Phononic (US) VP of Sales
- Retail Robotics (PL) CMO
- Sensei Tech (PT) CEO
- Spryker (DE) Co-CEO
- Stor.ai (IL) CEO
- Swisslog (CH) Sr Consultant, Grocery

- Takeoff Technologies (US) CFO
- TGW (AT) VP Business Development Grocery MFC
- Urbantz (BE) CCO
- Urbx (US) CEO
- Vargo (US) VP & Growth Officer
- VST (UK) CEO & Co-founder
- VTEX (US) Analyst in Residence
- Wynshop (CA) CEO

## INTERVIEWS - OTHER:

- Apex Insight (UK) Director [\[Link\]](#)
- Brick Meets Click (US) Partner [\[Link\]](#)
- Bricz (US) CEO [\[Link\]](#)
- Gillespie Manners (UK) CEO [\[Link\]](#)
- OSF Digital (US) SVP [\[Link\]](#)
- Savills (UK) Director [\[Link\]](#)
- TPG (US) Partner [\[Link\]](#)

+ multiple companies & individuals that requested anonymity including global FMCG/CPG brands, SW/HW vendors, grocers, consultancy firms, etc.

STIQ completed 56 in-depth interviews for this report

## EVENTS (STIQ RECOMMENDS):

- LogiMAT (DE) [\[Link\]](#)
- Modex (US) [\[Link\]](#)
- Shoptalk Europe (UK) [\[Link\]](#)
- Groceryshop (US) [\[Link\]](#)

## E-GROCERY INFRASTRUCTURE GLOSSARY

- |          |                                      |
|----------|--------------------------------------|
| 3PL      | Third Party Logistics                |
| AGV      | Automated Guided Vehicle             |
| AMR      | Autonomous Mobile Robot              |
| AMV      | Autonomous Mobile Vehicle            |
| AR       | Annual Report                        |
| ASRS     | Automatic Storage & Retrieval System |
| BOPIS    | Buy Online Pick Up In Store          |
| CFC      | Central Fulfilment Centre            |
| CMS      | Content Management System            |
| CPG      | Consumer Packaged Goods (US)         |
| DC       | Distribution Centre                  |
| ERP      | Enterprise Resource Planning         |
| EV       | Electric Vehicle                     |
| Fiducial | Marker used to localise a robot      |
| FMCG     | Fast Moving Consumer Goods (UK)      |
| FTE      | Full Time Employee                   |
| M&A      | Mergers & Acquisitions               |
| MFC      | Micro Fulfilment Centre              |
| MHE      | Material Handling Equipment          |
| OPD      | Orders Per Day                       |
| OPW      | Orders Per Week                      |
| RAAS     | Robotics as a Service                |
| ROI      | Return on Investment                 |
| ROS      | Routing Optimisation Software        |
| POS      | Point of Sale                        |
| SAAS     | Software as a Service                |
| SMB      | Small & Medium Businesses (US)       |
| SME      | Small & Medium Enterprises (UK)      |
| TCO      | Total Cost of Ownership              |
| WCS      | Warehouse Control System             |
| WES      | Warehouse Execution System           |
| WMS      | Warehouse Management System          |

## FURTHER RESOURCES (CONTACT US) FOR:

- Market size data. To discuss this report or the wider sector. To learn about what new equipment is on the market, useful deployments & solutions, etc. [tom@styleintelligence.com](mailto:tom@styleintelligence.com)





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SPEAKERS

**100+**  
JOURNALISTS &  
EQUITY ANALYSTS

## YOUR GPS FOR GROCERY'S MASSIVE TRANSFORMATION

Grocery's digital transformation is not slowing down -- and neither can you.

Groceryshop serves as the industry's personal GPS, helping businesses navigate the rapid rise in ecommerce, the latest business models and technologies, and the changing consumer behaviors that are leaving a lasting impact on the industry.

Groceryshop brings together 4,000+ leaders across the ecosystem from established and startup CPG brands, supermarkets, c-stores, drug stores, general merchandise stores, discount stores, ecommerce players, warehouse clubs, grocerants and non-traditional grocery retailers.

Across four days, our jam-packed agenda will feature informative, unrivaled talks on the changing grocery landscape from 200+ industry leaders as well as opportunities to connect and network with peers and potential partners.

**GRAB YOUR TICKET TODAY!**




DEMATIC

## Future Proof Your Supply Chain

With Dematic's flexible integrated solutions and AI-led software

[dematic.com/software](http://dematic.com/software)



 **mercatus**

## The Keys To Success with Online Grocery Fulfillment

