



The Future of Retail is Here, and It's Powered by Embedded Computer Vision

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Founder & CEO
Grabango

Checkout Free Shopping



- What is checkout free shopping?
 - Enter a store
 - Grab what you want
 - Get on with your day
- What it's not:
 - No lines
 - No barcode scanner
 - No hassle
- Why?
 - To eliminate lines and save people time



Computer Vision Enables the Future of Retail

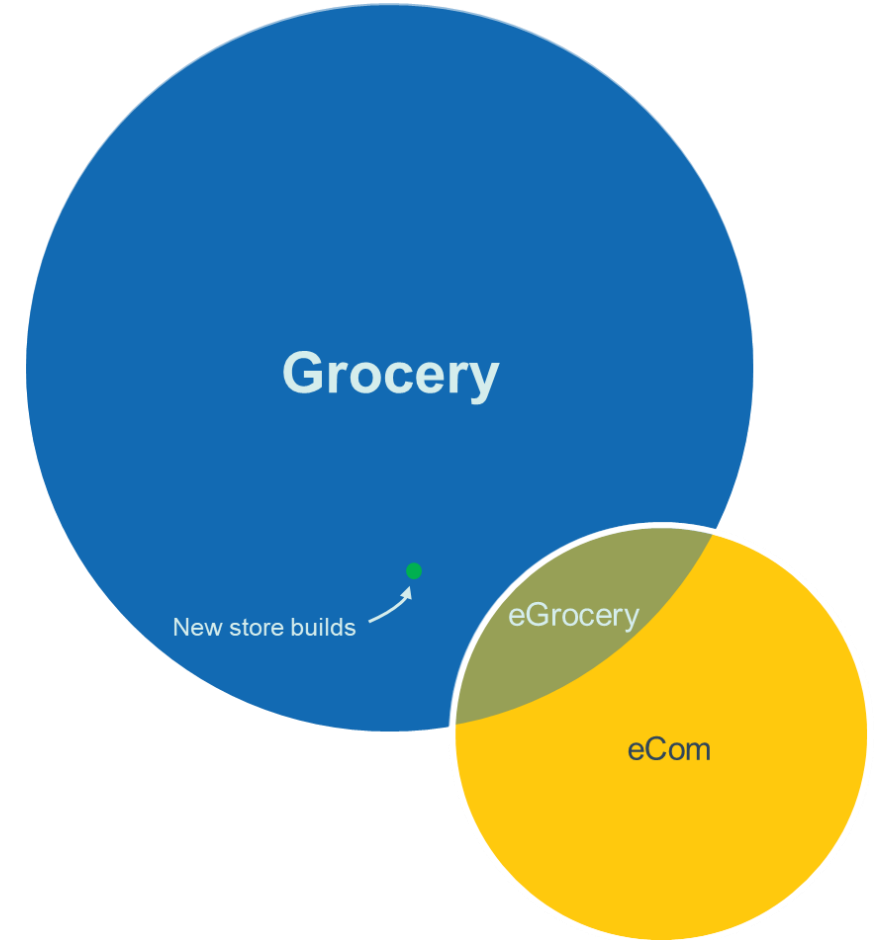


- Human interaction with Things has changed
 - People behave normally
 - The accounting is automated
 - Fewer *-apparent-* computers involved
- Disruptive without being disruptive
 - Radically alters store competitiveness
 - Preserves store operations
 - Preserves shopping experience
- Moving very quickly
 - Shoppers love it
 - Retailers love it

The Market is Enormous



- Grocery sales are \$5T
 - Bigger than all of eCommerce
- 95% of food is bought in physical stores
 - Despite covid & two decades of efforts online
- Retrofits are the only way into the market
 - New store re/builds are too slow to matter

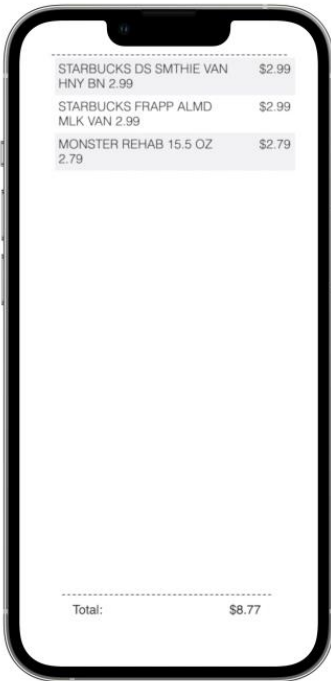


The Vision System Generates Receipts



RealView

grabango®



What Does the Market Want?



- Product requirements:
 - Delightful shopper experience
 - Rapid scaling into existing stores
 - Low cost for high retailer ROI
- Some technologies use shelf sensors
 - IoT is quick to POC
 - Expensive
 - Brittle
 - Limitations



Pure CV is Awesome



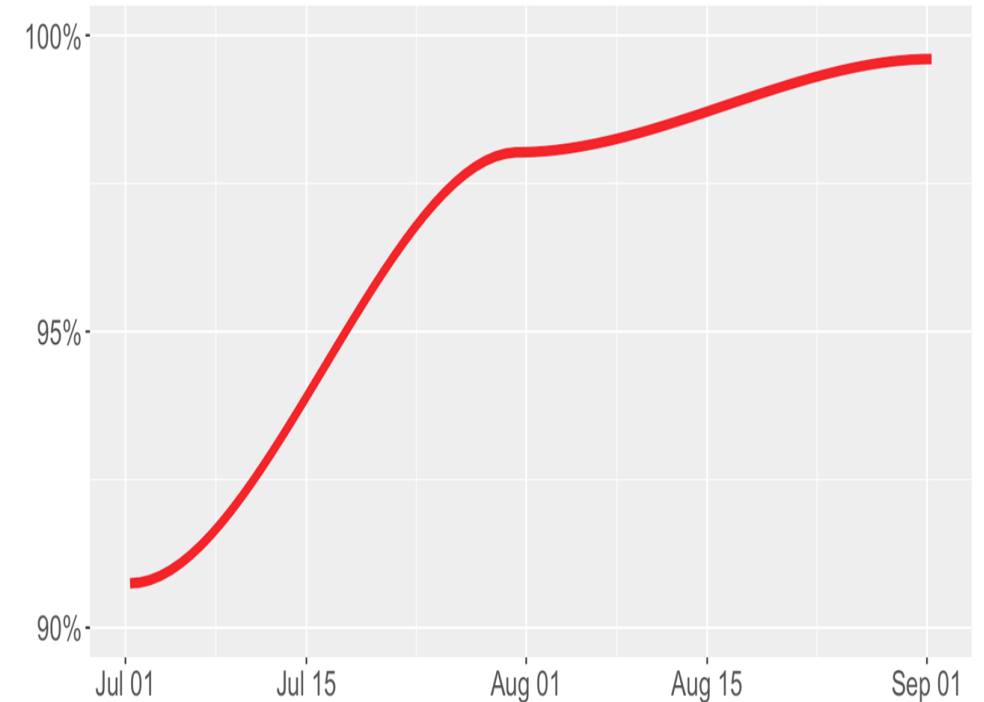
- Fluid shopper experience
 - Put backs are ok
- Rapid installation
 - Much less hardware
 - Existing shelving
- Fully flexible
 - All SKUs included
 - No reprogramming when items change
 - Sales and promotions are ok



Pure CV is Difficult



- Build a system
 - Collect data
 - Build infrastructure
 - Train models
 - Deploy hardware
 - Retrain models
- The last 5% is really hard
 - Edge cases are challenging
 - ROC curves are unforgiving
 - Shopper behavior will surprise you



99.6% revenue accuracy, after training

Wow, That's a Lot of Data!



- A single grocery store might generate 20 PB data per day
 - 1000 cameras
 - 24 hours per day x 60 minutes x 60 seconds
 - 10 frames per second
 - 8 M pixel per frame
 - 24 bits per pixel
- Even compressed, that bigger than "big data"
 - WiFi won't work
 - Last-mile internet would struggle
 - The Cloud might work, but at a big cost
 - HDDs might work, but you'd need a lot of them



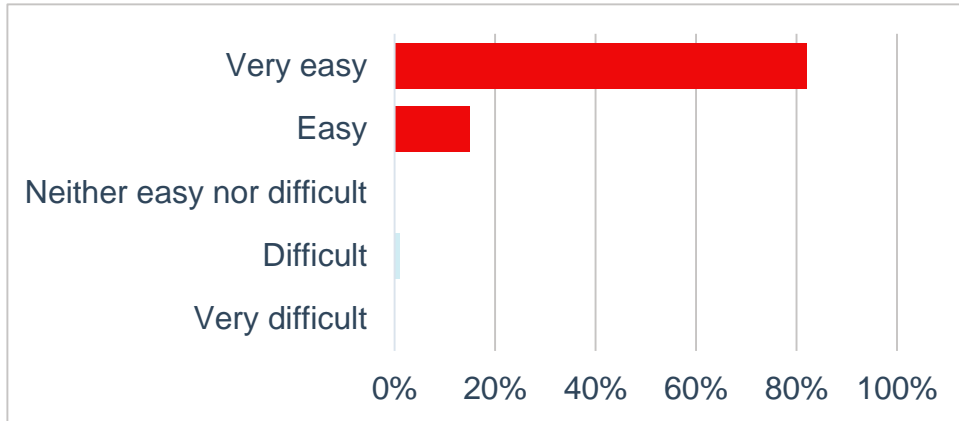


- Local processing is essential
 - Like with driverless and robots
 - But for a different set of reasons
- So, we had to build our own platform
 - Image sensors
 - Embedded AI compute
 - Data network
 - Power distribution grid
 - And add failover for robustness
- Data -> Information -> Value
 - Pixels -> Shopping Events -> Accelerated Commerce

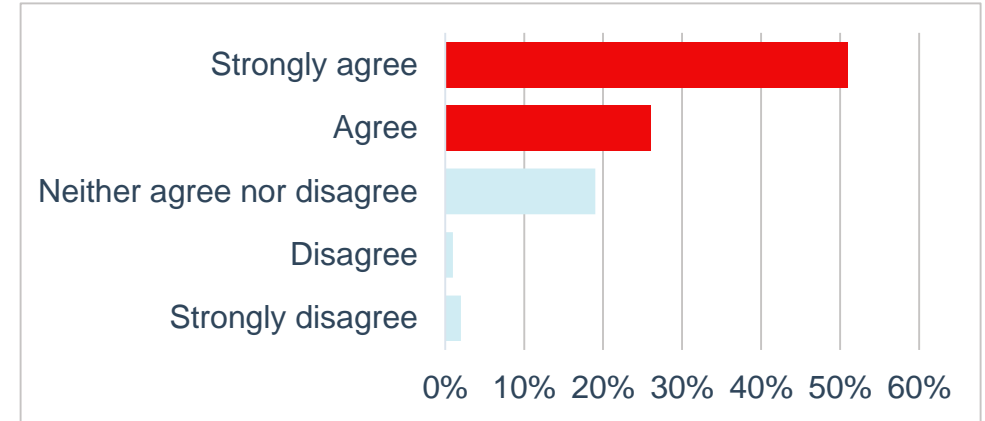
Shoppers Love it!



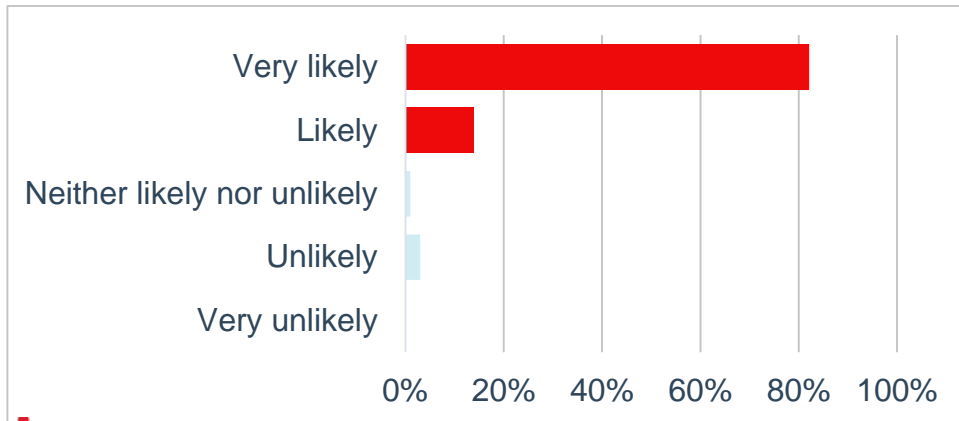
97% Think Grabango is easy to use.



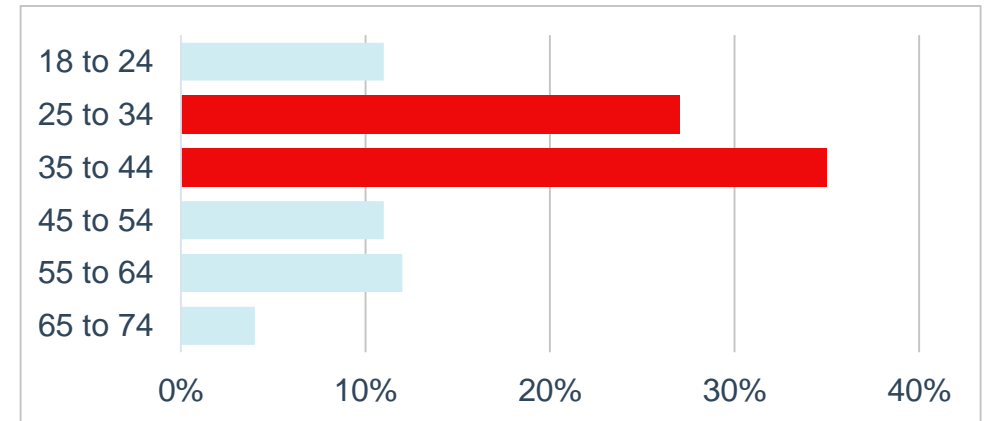
77% More likely to visit a Grabango store.



96% Likely to use Grabango again.



All ages love Grabango.



Retailers Love it!



- Computer vision is the technology of the decade
 - It is forever changing the way people interact with things
- Embedded CV is revolutionizing retail
 - It's the technology that best-fits the market
- Grabango is leading the way
 - To eliminate lines and save people time
 - To meet people where they already shop
 - To work with fantastic partners



Unannounced
Fortune-25 brand

Unannounced
Top-10 Grocer

Guiding Company Values



People First

Hire the best, and treasure them.

Integrity

Do the right thing, particularly when you don't have to.

Inclusion

Foster an environment that welcomes all, to enable our best selves.

Don't Live with Broken

Have the courage to admit mistakes, and the urgency to correct them.

Bold Innovation

Think recklessly, but temper your actions with pragmatism.

Customer Focus

Deliver beyond expectations, both internally and externally.

Simplify

Everything should be made as simple as possible, but not simpler.

- Why is Grabango's leading in the space?
 - Well funded industry initiatives
 - Equity incentivized startups
- Success is about Execution & Execution is about Team
 - Phenomenal teams triumph
 - Hard skills for hard problems
 - Soft skills because we're all soft inside
 - Team effort, into a team project, results in a team win
- Hyper-selective
 - 10x harder to get into than Stanford University
 - Growing as fast as we can find great people



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