Computer Vision in FMCG: Hype or Real Difference?

Market overview, objectives, projects and implementation stages

GOODS CHECKER

Table of contents

Introduction

Artificial Intelligence and Computer Vision in particular have become an integral part of our life. Pretty much everybody translated texts using a smartphone camera and Google Translate.

While technology has penetrated everyday life, what price business? A lot has been written about computer vision in FMCG and retail: what it is, its benefits, examples of implementation, etc. Companies in the FMCG industry are extensively testing and introducing this technology to upgrade the quality and accuracy of business processes and improve customer experience.

Today, computer vision technology has almost reached maturity and brings true benefits to companies, while its areas of application are steadily expanding.

Evolution of Computer Vision: Current Trends and Analysis

There has been a lot of talk about computer vision and artificial intelligence for a long time. Analytical and statistical reports present different types of artificial intelligence and related technologies. For example, Gartner even identified a separate "hype cycle" for AI technologies, which includes computer vision. Let's figure out what computer vision is.

Computer Vision (CV) is an area of artificial intelligence that can analyze incoming images and videos. It contains methods that give a computer the ability to "see" the desired data in an image and then process it: recognize, classify and identify objects; monitor status and changes, track the movement of subjects and objects on video.

Gartner:
computer vision has reached the slope of enlightenment

According to Gartner Hype Cycle, computer vision is already on the "Slope of Enlightenment." Let's figure out what this means.

The hype cycle is a graphical representation of the maturity, adoption and social applicability of new technologies.

Hype Cycle for Artificial Intelligence, 2023

gartner.com

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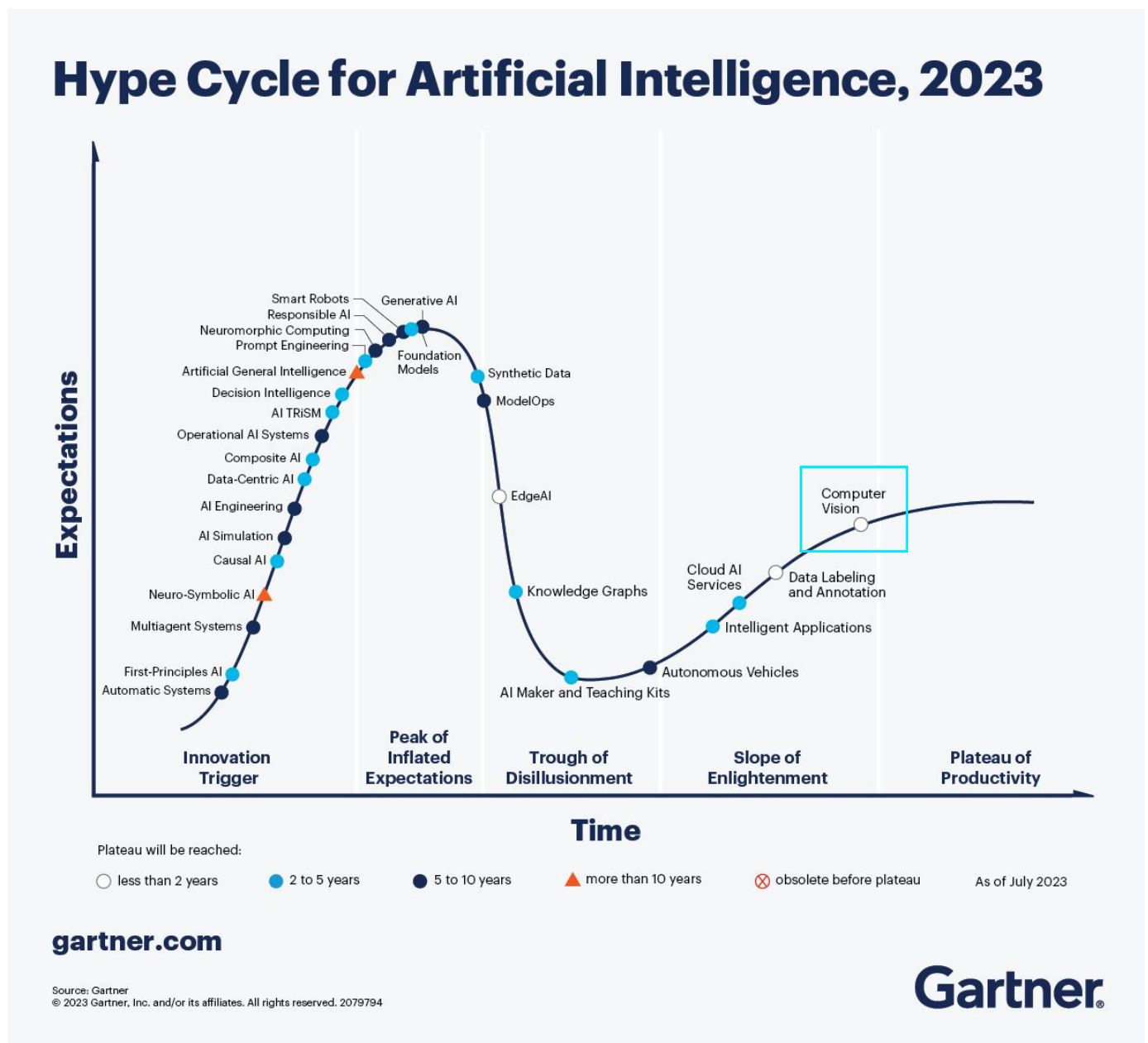
Gartner

Let's explore the Gartner Hype Cycle for computer vision and see how the technology has evolved:

1

Innovation Trigger, early 2010s. Computer vision began to draw media and business attention with impressive prototypes and demonstrations, although commercial applications were still few. Early research was carried out in the field of deep learning of neural networks; applications for face and object recognition were developed, for example, at Stanford University.

2

Peak of Inflated Expectations, mid-2010s. Expectations around computer vision are reaching a peak. Media and analysts predict its revolutionary impact on the industry. Startups and large companies are heavily investing in development; companies such as Tesla with autopilot and Google with Google Photos are emerging.

3

Trough of Disillusionment, late 2010s. The technology does not live up to high expectations, facing technical challenges and scalability issues. The market is beginning to critically evaluate the capabilities and constraints of computer vision, and the growth of startups in this area is slowing down. There is an emerging awareness of technical and ethical issues, such as facial recognition errors and data privacy like Facebook's.

4

Slope of Enlightenment, 2020-2025. Better understanding of true capabilities of this technology is growing, and companies are starting to introduce computer vision into business processes, thus achieving tangible results. More stable and productive solutions are developed, and deployment costs are reduced. For example, Walmart has successfully implemented computer vision for inventory management.

5

Plateau of Productivity, after 2025. The technology becomes mature and ubiquitous: it is integrated into business processes and commercial products, increasing their efficiency. Computer vision is widely used in medicine for disease diagnosis, in transportation for autonomous vehicles, and in security for monitoring and access control.

On the Slope of Enlightenment, technology is beginning to recover from a period of disappointment as companies better understand the real-world applications and benefits of the technology. This sets realistic expectations. At the same time, the technology is being refined based on feedback from real-life users.
More and more companies are conducting pilot projects and implementing computer vision. In turn, vendors continue to improve their offerings, making the technology more reliable and convenient.

Drivers and Challenges in Adoption of Computer Vision in Retail and FMCG

Let's take a look at the numbers. Adoption of computer vision technologies is growing at a rapid pace. The global computer vision market is estimated at $20.3 billion in 2023. The market is projected to grow from $25.4 billion in 2024 to $175.72 billion by 2032, **growing** at a CAGR of **27.3%** during the forecast period.

According to recent studies, more than 50% of retailers have already invested or are planning to invest in computer vision to streamline their operations and reduce costs. Before adoption, each company evaluates how computer vision will affect the company's business processes and weighs the pros and cons of the project.

The global computer vision market

Year	Value
2023	20,3
2024	25,4
2032	175,7
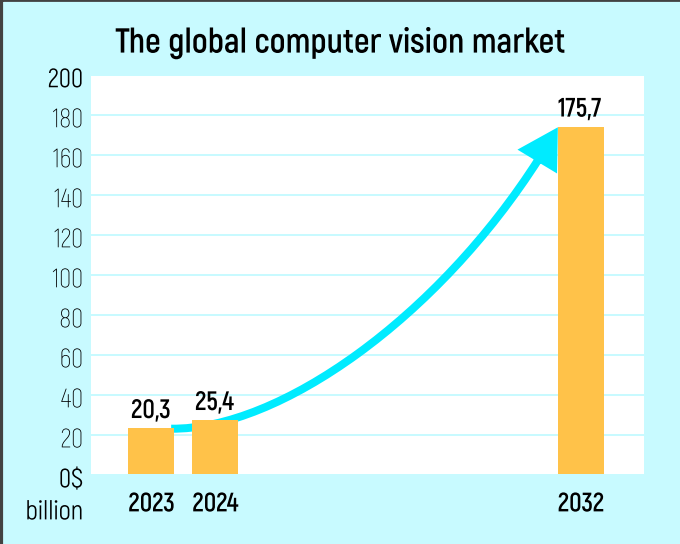
Adoption drivers

1

Business process optimization. Computer vision automates routine processes such as checking product displays, inventory management and product quality control. This speeds up processes and reduces costs. In addition, computer vision reduces the number of errors and improves the accuracy of processes.

2

Improved buyer experience. Consumer behavior analytics helps retailers understand hot spots and locations on shelves, analyze in-store behavior, improve displays, and create more relevant and personalized offers. All this drives customer loyalty.

3

Business intelligence upgrade. Computer vision collects complete, accurate, and reliable data to help you make informed decisions. This helps push up sales, improve the shopping experience and drive customer loyalty. Retailers using this data are seeing improved customer engagement and store efficiency.

All this together gives companies a competitive gain. Faster processes allow them to complete more tasks in the same time, and advanced analytics help them stay one step ahead of their competitors.

Barriers to computer vision adoption

There are also barriers to the adoption of computer vision. They can be divided into three categories: economic, technical and managerial.

1

High start-up costs. Deployment of some computer vision systems requires significant investments in equipment, licenses, software development and infrastructure. In addition, it is necessary to train employees to manage new systems, which also requires additional financial and time resources.

2

Integration challenges. Difficult integration with existing systems and the lack of capacity of the current IT infrastructure can also become a barrier to the adoption of computer vision.

3

Business process adaptation. The introduction of new technologies often requires changes to business processes, which can cause resistance by employees and stakeholders..
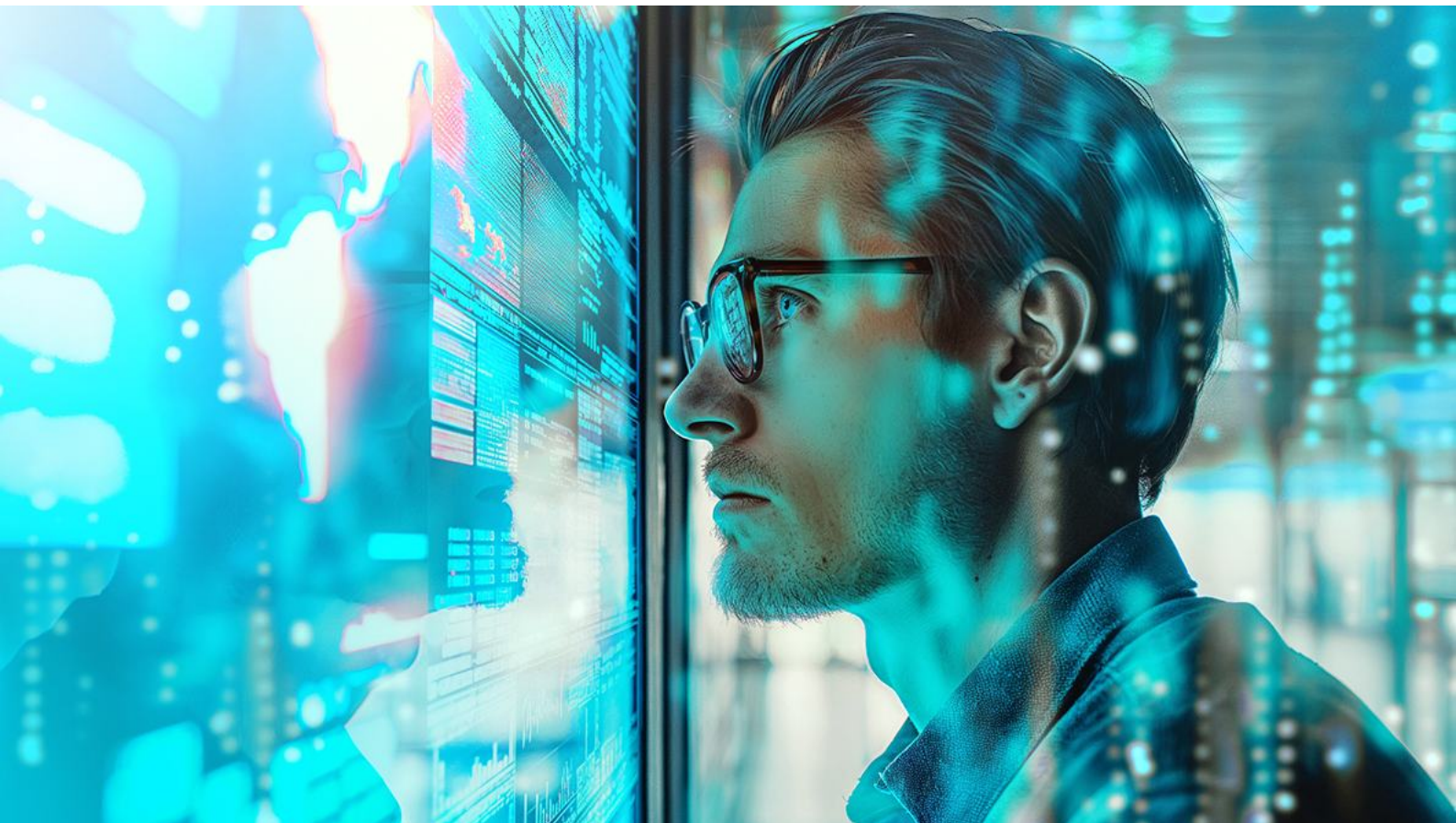
How IT vendors deal with barriers

Many companies are aware of these problems and are offering a solution.

1

SaaS model. Many solutions are offered through a SaaS model. This means that the FMCG company pays a monthly subscription to the service, like Spotify or Netflix, and can cancel the service at any time. The cloud-based approach ensures easy scalability - businesses can adapt to changing requirements and expand operations without facing engineering constraints.

2

Integration via API. By providing an API (Application Programming Interface), computer vision systems integrate seamlessly with an FMCG company's existing applications, avoiding the complexities associated with compatibility and data exchange.

3

**Piloting.** The cloud-based approach also helps FMCG companies test the solution, evaluate their performance and see the benefits of new technologies. Successful pilots help convince skeptical employees and stakeholders of the value of adoption.

How Different FMCG Companies Use Computer Vision: TOP 3 Cases

Let's investigate the tasks completed by companies using computer vision and their achieved results.
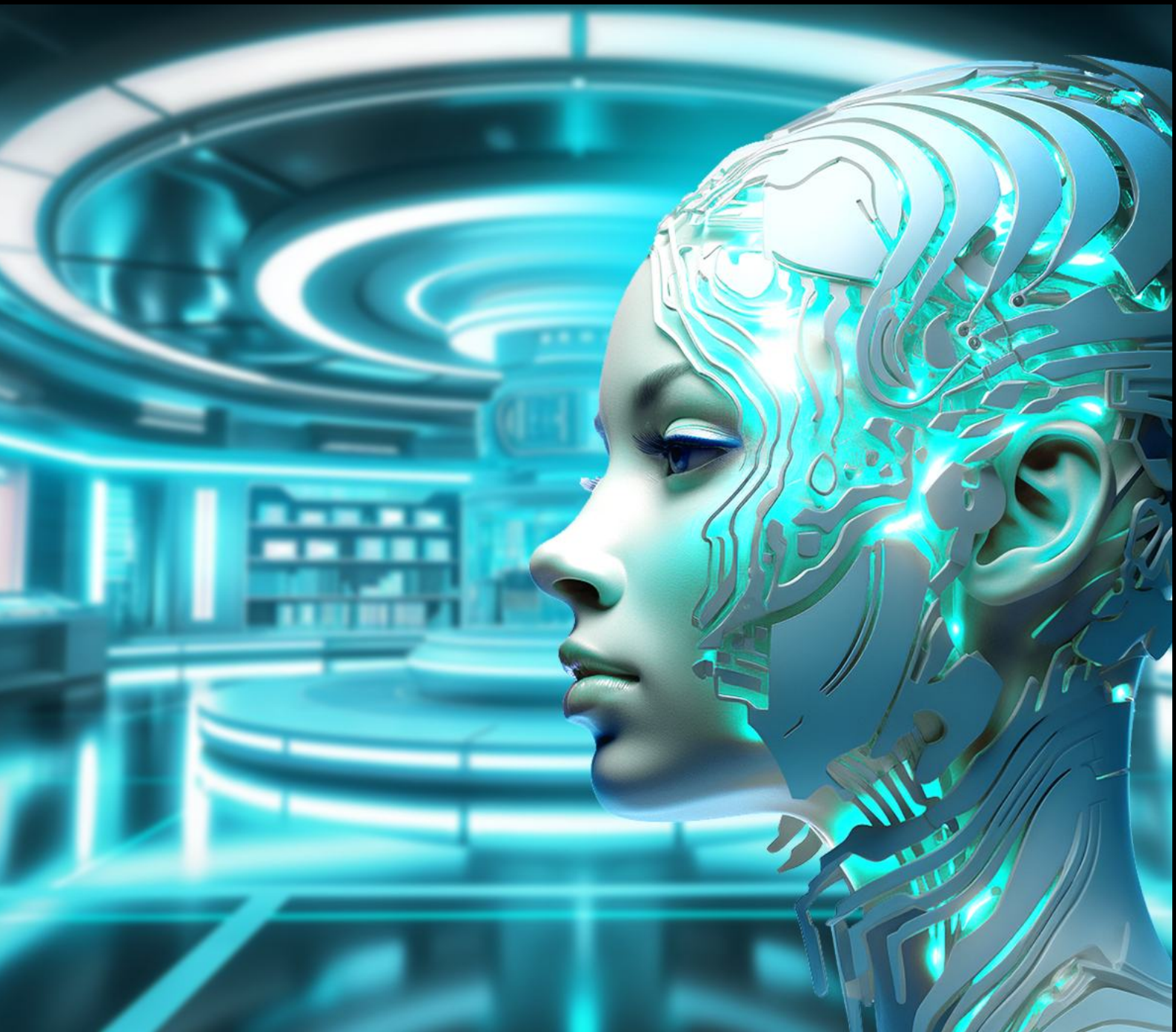
FMCG Manufacturers and Retailers

Monitoring of shelves and product display.
Computer vision helps to automatically monitor the availability and correct display of goods on shelves, notifying employees about the need to replenish stocks or correct errors in merchandising.

Buying behavior analysis. Computer vision systems track shoppers as they move around a store, analyzing their behavior and preferences to improve store layouts and marketing strategies.

Inventory management. Computer vision technologies help track inventories of raw materials and finished goods, automatically updating data in inventory management systems and thus reducing the risk of stock-outs or overstocks.

Project.
Analysis of Shelf Display for Major Tobacco Manufacturer

Highlights

100+ merchandisers

226 SKU (including competitors)

5,000 sales outlets

70,000 photos analyzed monthly

Business Challenge.
Analyze merchandisers' performance and promptly check the display of goods on shelves. Upon identification of any problems with display, provide retail outlets with information about non-compliance with marketing agreements.

Solution.
Use Goods Checker computer vision-powered application to monitor the display of goods and the performance of merchandisers. Merchandisers could acknowledge the completion of tasks in the application. At the outlet, merchandisers take photos of the racks, and image recognition results are uploaded as soon as an Internet connection is available. Goods Checker can run even off-line: images are processed as soon as the connectivity is restored.

Result.
It takes on average 15 seconds to obtain results. Since using Goods Checker, new products have been launched. It took 2 weeks to train with a new category; the recognition quality was 95%. It took 2-3 days to train with a new product (cigarettes), the recognition quality was 96%. Following the pilot project, the number of analyzed photos increased from 3% to 100%, and compliance with planograms improved from 60% to 90%.

Distributors

Automation of warehouse operations. Computer vision systems are used to automatically identify and track items in a warehouse, improving the accuracy and speed of inventory accounting and order picking.

Security. Computer vision technologies are used to monitor security in warehouses, preventing unauthorized access and tracking the movement of employees and equipment.

Display monitoring. Computer vision helps distributors monitor display and compliance with agreements with the retail outlet.

Project.
Identification of Errors in the Display of Premium Goods by the Distributor

Highlights

5 mobile app users

20 planograms

20 SKUs

80 retail outlets in one city

Business Challenge.
Working with different retail chains, a major multi-brand chocolate distributor faced the problem of inconsistency between the planogram and the display of goods in retail outlets. It was necessary to promptly provide information to retail outlets about non-compliance with trade and marketing agreements. We decided to use Goods Checker to analyze merchandiser performance.

Solution.
A group of products was chosen for the pilot project: boxes of premium chocolates. For them, it is very important how products are presented on store shelves, since the same high standards must be observed in all countries.
The project lasted 3 months: for 1.5 of them, the developers trained computer vision models and customized the system for the customer, and for another 1.5 months, auditors checked the display in real-world environment using Goods Checker.
In the course of work, the customer clarified the requirements, and the team added new functionality: for example, they improved the web application to view photos that the auditor uploads to the mobile application.

Result.
Goods Checker solution helped to identify actual violations of the display in the retail chain. The company's managers received a transparent display monitoring system and were able to improve their cooperation with the chain in terms of product representation.
Planogram compliance rate improved from 60% to 90%. The time for field audits in retail facilities has been reduced due to the high speed of Goods Checker: one image is processed in up to 30 seconds. The final recognition accuracy is 90%.

Merchandising agencies

Audit of display and compliance with planograms. Computer vision automates the audit process of product displays by checking compliance with planograms and ensuring high accuracy of reporting.

Performance evaluation of marketing campaigns. Computer vision systems collect data on how sales aids and POS materials interact with customers, which allows measuring the efficiency of campaigns and adjust them in real time.

Personnel and task management. Computer vision helps monitor the completion of merchandiser assignments in retail outlets, ensuring performance monitoring and optimization of employee routes.

Project.
Automation of Employee Operations for a Merchandising Agency

Highlights

62 SKUs (non-food products)

4,500+ sales outlets

200+ photos daily

95% or higher recognition accuracy

Business Challenge.
Automate checking the display of goods on store shelves using artificial intelligence.

Solution.
The company decided to use computer vision to automate manual processes in merchandising. For these purposes, they chose Goods Checker, a cloud-based solution for automating merchandising using artificial intelligence. The service allows users to create planograms, check the display and generate analytics. Processing of one photo takes up to 30 seconds, and recognition accuracy is 95-97%.
As part of the pilot project, 6 cities, 45 retail chains and 694 retail outlets were selected. There were 4 supervisors and 8 merchandisers working with the system. Based on the results of two weeks, we managed to achieve the target – recognition accuracy of 95%. Now the service operates in 4,500 stores throughout Ukraine. In the coming months, it is planned to cover all brands managed by the company's merchandisers.

Result.
The time spent by merchandisers on reporting has decreased by 70%. In the free time, the employee can additionally visit two more retail outlets. Recognition accuracy is 95%+ after 2 weeks of use. With Goods Checker, the customer was able to:
- Conduct an audit 60% faster
- Provide the client with reliable shelf analytics
- Analyze 100% of photos

When Companies Need to Adopt Computer Vision and How It Works

Computer vision is still classified as advanced automation, so businesses do not need it at every stage of their development. Let's consider three conditions for adopting computer vision in FMCG companies:

1

Basic process automation and structuring.
Companies should use solutions that automate basic processes, for example, use CRM systems. Basic automation will help the company see the effect of IT solutions, more objectively evaluate the return on investment, and also identify weaknesses in business processes.

2

Willingness for change and investment.
An important aspect when introducing innovative solutions is to be prepared for change. Transforming business processes, training employees to use new tools, introducing new methods – all this requires time and investment.

3

Available data.
Desirable, but not always mandatory. Computer vision requires data. This means that an FMCG company must collect and store information in any available source, be it its own servers or Google Drive. But even in the absence of information, IT companies can create synthetic data sets to train neural networks. This is exactly what NVIDIA and Google do, for example.

4 Steps to Adopt Computer Vision

Teaching a computer to "see" is not so easy. You need to "show" it a lot of photos so that it can determine the initial data. Photos must contain different combinations, attributes, objects.

A typical computer vision project consists of four main stages:
- Data preparation
- Selection of architecture and model training
- Evaluation and fine-tuning of the model
- Commercial operation

1
Data preparation.
At the first stage, it is necessary to prepare three sets of data: for training, validation and testing. Using these datasets, we train the neural network and check its quality. "Live" photographs are not perfect – they have highlights, glare and other defects. In order for algorithms to recognize such images, it is also necessary to add various types of distortions to the datasets.

2
Selection of architecture and model training.
After the data is prepared, we select the model architecture and train the neural network. Training takes place in several stages. Each stage consists of two parts: training and testing. The model identifies patterns and consistently tests them during the validation process, which allows the algorithms to more accurately recognize objects with each new iteration.

3
Evaluation and fine-tuning of the model.
After training, the neural network is launched on the test dataset. If the algorithms label the photo incorrectly, we correct it and repeat the process. Adjustments include changes to the training dataset, model parameters, or model architecture.

4
Commercial operation.
Once the neural network consistently labels photos with accuracy above 95%, it can be put into commercial use. At this stage, the application with the model is integrated into the business processes of the FMCG company. For example, Goods Checker can run as a standalone application or be integrated into existing IT applications using an API.

Conclusion

Computer vision is not just hype, but a practicable tool for improving business processes. It has proven to be beneficial for businesses, especially in the FMCG sector. Many retailers, FMCG manufacturers and distributors are already extensively using this technology to improve business processes and gain a competitive edge.

Computer vision helps automate routine processes such as product display monitoring, inventory management, and consumer behavior analysis. This results in lower costs, improved operational accuracy and better customer service.

Every year it becomes easier to adopt computer vision, since huge financial investments are no longer required. For example, the Goods Checker solution allows monitoring the display of goods using artificial intelligence, quickly processing photos and providing accurate results in real time. Thanks to SaaS models and API integration, companies can easily tailor these technologies to their current systems. Pilot projects and testing help ensure the effectiveness of solutions and minimize risks. The technology is becoming increasingly accessible, allowing businesses of any size to take advantage of its benefits to add to marketability and streamline their operations.

Its adoption can be simple and cost-effective, making this technology accessible and attractive to a wide range of FMCG and retail companies.

References
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2. Fortune Business Insights. Computer vision market
3. Insight. The Potential of AI in Retail: Key Considerations, Benefits & Use Cases

Computer Vision for FMCG Companies

Goods Checker is a cloud-based SaaS solution that helps analyze products and their availability on store shelves, compare the current product placement with the planogram, and generate detailed analytics.

Goods Checker Modules

### Operations with planograms: Plano Creator

It helps quickly create and edit planograms, keeping them accurate and up-to-date.

Product recognition and analytics: Shelf Eye

Goods Checker uses AI to analyze photos and detect all cases of planogram incompliance and out-of-stocks and provides analytics of your choice: share of shelf, number of facings, prices, etc.

Layout monitoring in the store: Check & Go

It assists managers in controlling merchandisers' routes and simplifies the work of field staff at retail locations.
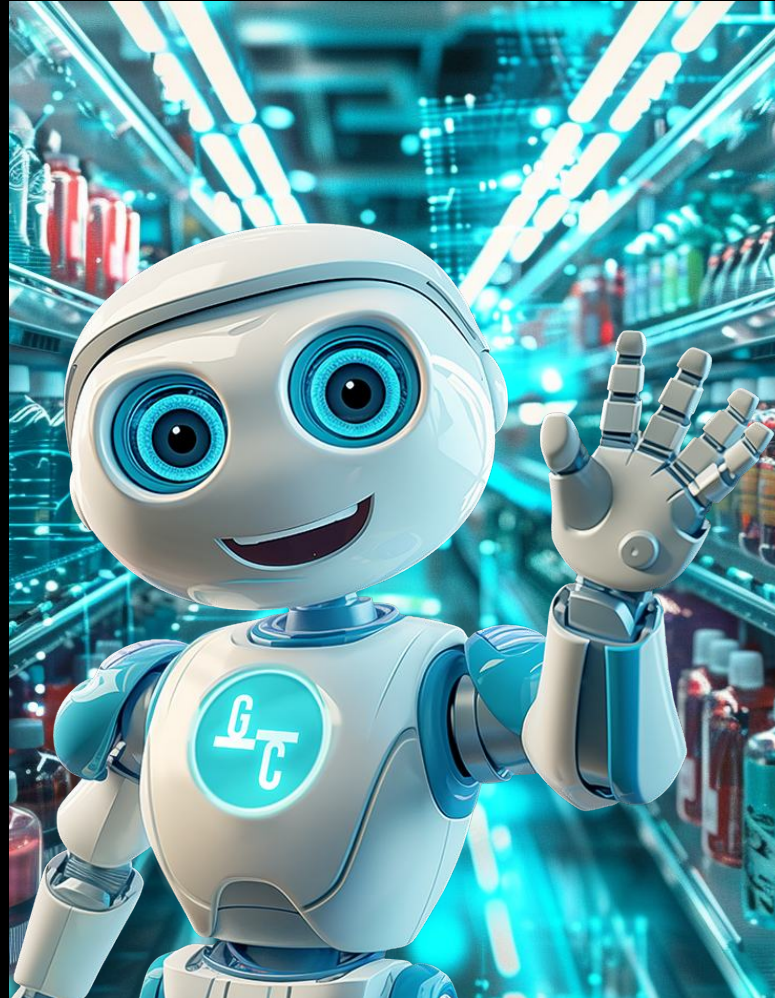
Goods Checker helps you know everything about the SKUs on shelf

Contact us

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