How to tell if computer vision can transform your business

[Adrian Walker, AIZA](#)   August 29, 2020 8:45 AM

Guest

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During my career as an automotive engineer at Ford Motor Company in the early 2000s, world-class vision system technology was already routinely being used for various applications on programs and production. However, the automation around the analysis had not yet come full circle. Today, it has. And with the latest iterations of smartphones for facial recognition and other functionality, most anyone with a smartphone already has a device using

[computer vision](#). Machine and computer vision are also being used in applications such as satellite geo-analytics, food safety and processing, agriculture operations, augmented reality, human emotion analysis, medical diagnostics, robotic guidance, quality control, transportation coordination, utilities, security surveillance, and more.

As the technology proliferates across new sectors, it will be critical for business leaders to assess how computer vision could impact the trajectory of their organization. So let's take a deeper look at the real-world use cases emerging today. (For the sake of this discussion, I'll use computer vision and machine vision interchangeably, even though there are slight differences.)

A quick primer

First, a quick look at where computer vision fits within the world of artificial intelligence: Deep learning is a sub-category of machine learning, which is a sub-category of artificial intelligence. Computer vision and machine vision usually rely on deep learning algorithms for proper weighting and training of visual data. Machine vision may also use a hybrid of various machine learning techniques to get to the desired level of output reasoning. From a business perspective, what you need to know is that this is one of the fastest growing sub-categories under the artificial intelligence umbrella for real-world applications.

Machine vision gives hardware the ability to observe and interpret its environment from what it "sees." It requires input from vision systems, which have been around for decades within many industries.

Top-line growth is king, but bottom-line growth is the throne. With computer vision, you get both, and this is why we're seeing such a positive market outlook for this technology. Studies conducted by various market research

firms show the global market for computer vision for 2019 at [around](#) [$10 billion](#) and project we'll see it grow to $14 – [$33 billion](#) by 2025. Regionally, Asia-Pacific and the United States are leading in global market share today.

Why you should care now: The market drivers

My wife, who wears contacts, told me this week, after her most recent reorder from 1-800 Contacts, that they now use the camera on your phone or laptop to assess prescription updates for your order. This is computer vision. A closer look at this case study reveals that 1-800 Contacts [acquired Israeli-based startup 6over6 Vision](#) in December to implement this now deployed computer vision technology to all of its customers. Without publicly published results, we can only imagine both the top-line impact (wouldn't you prefer to order a commodity like contacts without needing to leave your home to see a doctor?), and bottom-line impact this has for 1-800 Contacts' core business. There are not many technologies that give an organization those kinds of results, with that kind of scale, that quickly.

In a separate example using the same core computer vision technology for energy utilities, I've seen case studies that show an 80% reduction in image recognition, classification, and response time for grid monitoring, while increasing the inspection coverage area on the grid by 15x. In addition to the day-to-day operational benefits this tech is having on the utility ecosystem, imagine the positive impact it has for states with increasingly complex and overwhelmed grid operations that need to be able to stand up to wildfires, flooding, power outages, and other key challenges.

Eyecare and utilities are completely different industries, yet computer vision applications are having significant impact on both. And those are just two examples from a growing number of case studies. In fact, we're now seeing a big uptick in computer vision applications across many sectors. Why now?

Because, when you look at the basic economics, the market drivers outweigh the technology barriers:

Market drivers for computer vision:

- Increasing inspection, safety, and security needs
- Need to optimize daily operation activities
- [Need to scale automation](#) to increase bottom line
- Decreasing cost to purchase and scale the technology
- Decreasing time to build world-class computer vision and machine intelligence applications
- Increased accuracy of computer vision and artificial intelligence algorithms
- Increased activity in the capital markets to resource the product development
- In a worldwide pandemic with increased remote work required, this technology provides a solution for workers to "see" what's happening remotely.

Barriers to adoption:

- Executive decision-makers face a learning gap when it comes to understanding the massive positive impact on their organizations
- Companies specializing in computer vision are still grappling with correct pricing and determining which business models will become standard
- It's not a simple technology to build and scale properly; requires highly-skilled teams
- Development costs in the initial phases are still high enough to prevent massive development and adoption across the board for smaller businesses

- Real-time processing requires good communication connectivity.

The potential

More exciting advancements in computer vision applications can also be seen coming from the Digital Health and Telehealth sectors. In a world where we are now experiencing new rules around human interaction that affect in-person medical check-ups, computer vision is a fantastic solution to help providers with various medical diagnostics and primary care options. It can also be seen in clinical diagnostics, such as interpretation of radiological imaging. In biotechnology, computer vision is starting to make its way into genomic and proteomic analysis. And in agriculture tech, companies such as John Deere have made acquisitions to get in the front of the wave to leverage applications helping farmers assess crops/crop yields at a fraction of the time and cost. As this expands, it could have a huge impact on the world's food supplies and mitigating shortages.

Finding a fit

If you and your organization don't have a process for implementing innovation and transformation yet, there is no better time than now. There is a lot of information available around lean/agile development, and design thinking constructs that help businesses with this exact thing. If you already have something in place, start small with a pilot and go from there. If you're an executive in the organization, you should always consider which business units the innovation touches most and how to properly implement within and across your business units. Digital transformation for an enterprise has more hurdles to address with the soft side of human management than it does with technology. In my experience, technology is never the constraint, it's the proper implementation for the culture of your organization and the culture you want to build that is really the true driver for successful adoption. Your

people and teams should learn to love it like all tools that make their life better, but there is nuance in executing that for any executive team.

If you're in ideation mode and exploring or brainstorming around where and how artificial intelligence applications can help drive new opportunities for your business, think of how nature works, since learning from nature gives you the best path of understanding application. The question to really ask yourself is, where can our senses — sight, touch, hearing, smell, and taste — be used to transform core business functions if combined with almost limitless computation? It's safe to say that if sight is needed for any transformational move your company does or will need to do, you can find a way to streamline the automation of it via computer vision technology as a great point on your organization's continuous innovation journey.

Adrian Walker specializes in artificial intelligence strategy and product development. Today, he is CEO of [AIZA](), a machine vision and autonomous systems company, and Managing Partner of [Telescopic Ventures](), an early-stage venture capital firm. Prior to that, he worked as an automotive engineer as well as a utility inspection quality engineer.