

Automatic transmission

MANY PARCEL HANDLING PROCESSES CAN BE AUTOMATED TO GAIN CONSIDERABLE COMPETITIVE, PERFORMANCE AND COST ADVANTAGES

Sorting parcels? If so you could be making substantial performance gains and cost savings by embracing the latest automation technology. In recent years Prime Vision has been one of the driving forces behind the take-up of fully automated parcel handling. Its products are highly innovative providing 100 percent parcel automation and a swift return on investment. Since the original ParcelVision installation in 2004 – the world's first successful modular parcel OCR system – Prime Vision has expanded its installed network to more than 35 sorting centres for postal and parcel organisations globally.

Rapid ROI and eliminating costly manual handling are benefits taken for granted. Eddy Thans, CEO of Prime Vision, says: "What makes the difference according to our clients are the innovations from Prime Vision, our independence and expertise in the field. ParcelVision has developed beyond our wildest dreams and our investment in R&D is yielding new enhancements on a monthly basis."

The primary task of ParcelVision is to expand traditional automated identification technology (barcodes) with OCR to read printed and hand-written addresses and information on parcels. Any automated identification system will result in a small percentage of 'no-reads', however ParcelVision also integrates a very powerful video-coding system that allows parcels to remain on the sorter, eliminating further manual handling, relabeling, etc.

ParcelVision is a centralised management platform that supports an ever increasing range of modular solutions, including hardware to capture parcel images, weight and dimensions, decoding the 1D and 2D barcodes, reading any text or addresses via

OCR, video-coding, archiving, process monitoring, and many more tasks.

For some clients ParcelVision could be based entirely on barcodes and video-coding as an initial implementation, especially if most of their customers' parcels have standard labels. This provides all the benefits of a standard identification platform where additional modules may be easily added later. This is a great business case as video-coding will eliminate manual handling and reprocessing of the parcel and a very low cost of entry to purchase the system. So thanks to ParcelVision, OCR and video-coding is now an integrated solution and for most of today's parcel automation projects both elements are considered at the system design stage.

In 2003 that was truly an innovation. While the concept of parcel OCR has been

around for some years, Prime Vision's first installation at TNT in the Netherlands was the first successful integrated system in the world. TNT took quite a leap-of-faith in commissioning the system as there had been at least two very high-profile attempts by other vendors at other European clients that had failed.

How are current innovations delivering enterprise-wide benefits? The core features of ParcelVision greatly improve sorting-centre operations in terms of maximising automation, reducing staffing, costs and errors, and increasing throughput. Trends in the market have led to the development of what Prime Vision terms 'location-independent' and/or 'web-enabled' enhancements for ParcelVision.

Many of Prime Vision's projects start out at a single parcel sorting centre and prove



so effective that the client deploys it at other – and even all its other – sorting centres nationwide. This raises many opportunities and enables Prime Vision to consider operational needs at enterprise level. How can the valuable data that is collected be better used? How can redundancy be increased in this time-critical business? How can resources be better shared and scaled across a complete nationwide network?

For example, consider that you have a small video-coding team located at each of your six sorting centres and sorting centre number one is short of resources (perhaps some video-coders can't get to work because of a snow storm). Why not send some of the video-coding work to another sorting centre?

In some cases clients will have an enterprise network linking facilities, however rarely are these links sufficiently robust to be reliable. Nor do they have the necessary bandwidth. The most robust redundant network is the WWW, so Prime Vision has developed enhancements that

deliver the total availability of the WWW with the security of a closed business network. Its video-coding and parcel-image archive modules are the first to benefit from this development.

ParcelVision went nationwide at three sorting centres in The Netherlands in 2007, Austria followed with seven sorting centres in 2008 and Finland is currently in progress. Denmark will be the first client to take delivery of the web-enabled parcel-image archive.

Increasing scalability

With ParcelVision it's easy to scale-up your automation – just add another server in the centralised server rack and run some more OCR clients. Video-coding is easy and scalable in the same way, but there are additional points to consider as each video-coder requires investment – at a cost – that may be necessary at the peak of the Christmas season but perhaps not in July. Video-coders are humans and they like to have a nice working environment, but what happens if you don't have the space at the

Christmas peak? Well, web-enabled from Prime Vision will revolutionise video-coding too.

Web-enabled video-coding from Prime Vision means you can access a pool of home-based video-coders. They don't have to be near the sorting centre or even in the same country. Training and quality control is essential, along with supervision, data integrity and security. Prime Vision's existing video-coding module meets all these requirements; in essence this amounts to the extension of the network cable.

As part of this powerful video-coding module Prime Vision can provide clients with a training course and examination that is DVD based; new trainees can train at home and be scored either remotely or at the office. The video-coding module also has an integrated quality-control engine that seamlessly submits test images into normal production, so quality control becomes continuously measurable by a wide range of metrics. As far as the video-coders are concerned, they cannot determine if an image is production or quality control.

In addition to the benefits of scaling up your operation without scaling up your costs, web-enabled video-coding presents opportunities to implement a 'cost-per-click and quality' payment scheme for employees.

Breakthroughs in recognition

Prime Vision has also been developing its core OCR technologies, leading to new patents being awarded. "We have made several breakthroughs," says Prime Vision's Head of Research & Development Michiel de Rijcke. "Our techniques are based on Prime Vision's patented HYCR (High Yield Character Recognition) technology and these breakthroughs have greatly enhanced performance in key areas of region-of-interest finding and handwriting recognition. We take a holistic approach to parcel recognition, which is essential for the highest read-rates. We have new techniques in filtering and normalising address elements, skew detection and noise reduction, which all contribute to improved read-rates and accuracy. Some of our projects require integration of very large databases and we have developed smart new fast-access techniques to reduce the number of queries and process times.



Finally if you compare the requirements of OCR solutions for letter mail with the demands of OCR on parcels you realise the importance of high-performance region-of-interest finding techniques.

"It's much more than just OCR. You only get a successful result if you feed in the correct information in the first place. In the case of letter mail the maximum target area for address information is approximately A4 in size, but for parcels it could be up to 9m². That's a huge area to search, select and process multiple possible regions-of-interest on sorting systems that can be

capturing up to two parcels per second. You could say that a parcel is just a very large letter in terms of processing, however this will not lead to a high read-rate and low error-rate. Our speciality is providing very high performance, tailored and optimised to a client's specific application. With parcels we can exploit helper information, such as the presence of barcodes, logos, ZIP codes and standard labels to guide the region-of-interest finder. Equally the same solution must also perform for parcels where no helper information is available, where there may be multiple hand-written addresses on multiple sides of the parcel for example. To deal with these extremes is the challenge and one we are successful in meeting."

Importance of open architecture

You won't hear many suppliers promoting open interfaces and systems, but it is a passion for Prime Vision and in the best interests of the client. Closed – or proprietary – systems severely limit the

scope for improvements and enhancements in the future. ParcelVision's architecture is flexible and scalable and can include open interfaces that meet specific requirements. Due to the company's experience in building open systems, some clients ask that Prime Vision design and build an interface to a published standard.

Prime Vision's role on any project is geared to specific requirements. In many cases it offers a complete turnkey solution for 100 percent parcel automation, integrating all hardware and software modules. For example a current project for a major European parcel organisation will take delivery of the ParcelVision system, including CCD camera technology, certified DWS (dimension, weigh and scan) equipment, OCR and video-coding completely installed and commissioned by one of Prime Vision's dedicated project management teams. In other scenarios, Prime Vision works with all the leading sorter and camera systems suppliers to design and deliver solutions. ■

ParcelVision and its modules

- ParcelVision – the overall platform comprising a centralised application at the sorting centre.
- TrafficManager – manages interfaces with all system modules, data capture, sorter machine and customer host computers. Directs all processes – barcode reading, OCR and video-coding.
- OCR – automated reading of machine-printed and handwritten information.
- Video-coding – the lowest cost approach to 100 percent parcel automation. High performance and ergonomically designed for speed, accuracy and quality control and configurable to specific coding requirements. Includes live-lookup techniques to pre-fill data fields during coding, reducing the number of keystrokes and coding time. Now web-enabled for flexible deployment.
- Parcel image archive – record every step in the processing of every parcel, including actual images of up to six-sides of the parcel. The graphical user interface enables easy retrieval based on tracking number, time period or many other search parameters.
- PVPM (ParcelVision Process Monitor) – a powerful module that provides live system data with the whole sorting centre on one easy-to-view screen. Monitors all hardware and software components down to unit level, including cameras, dimensioners, servers, etc, and alerts the on-site team directly to any faults across the whole automation system
- LIT (Label Identification Tool) – customer labels are modified all the time as new customers and labels are introduced. LIT enables the sorting centre to program and update the ParcelVision system themselves without the need for updated software releases.
- LiveLink 24/7 support – many proactive support and response services are available to suit your requirements. The ParcelVision system is proactively monitored by our support desk.

