BEUMERGROUP

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VIDEO CODING AS REMOTE ENCODING TECHNOLOGY IN BAGGAGE HANDLING

› How airports can improve baggage handling performance by introducing better baggage handling processes and enhanced technology.

AIRPORT
WHITE PAPER

INTRODUCTION

Detailed analysis from the SITA Baggage Report 2016 indicates that in 2015, delayed bags accounted for 79% of all mishandled bags. The real challenge and the main issue that contributes to this high percentage, is the logistics of transfer baggage operations, which is the most critical part of a baggage handling system (BHS) and is under the most operational pressure.

For the baggage handling industry, the SITA Baggage Report 2016 also carried good news, with the mishandling rate in 2015 falling by 10.5% from the 2014 figure, to the lowest-ever rate of 6.5 bags per 1,000 passengers.

This white paper addresses how, by introducing better baggage handling processes and enhanced technology such as video coding, airports can continue to reduce the number of mishandled bags to further improve baggage handling performance.

UNDERSTANDING REMOTE ENCODING TECHNOLOGY

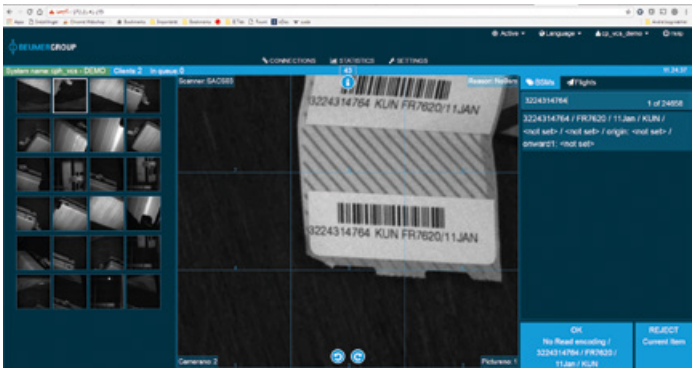
Video Coding System (VCS) and Optical Character Recognition (OCR) technology have been widely used in the parcel industry for decades to foster efficient sorting and transportation. The same software can also be used to identify the flight numbers and airport codes on baggage tags to improve the baggage handling process, using the cameras installed on the Automatic Tag Reader (ATR) in the baggage handling system. Airport trials and studies conducted by BEUMER Group show that the use of cameras to scan baggage tags can reduce the number of no-reads, simply because cameras and photographic technology are better at reading bad quality/ damaged baggage tags than conventional scanners.

Additionally, the introduction of these cameras in to a BHS makes it possible to add a video coding system (VCS), a remote encoding technology that allows bag source information to be encoded while the bag remains in motion within the main BHS. In the event of a 'no-read' baggage tag, an image is sent via the VCS to an operator who encodes the information remotely on a workstation or tablet. This saves valuable time by ensuring that the baggage flow is not interrupted.

The VCS user interface allows the operator to choose the best possible image selection of the tag from a series of pictures. The operator can zoom and pan and the system offers a search for best match whilst the operator types. The system also has an option to integrate with OCR.

VCS also introduces more flexibility in terms of better resource sharing and no operator idle time as remote encoding allows control-room staff to supplement or relieve MES staff during very high coding peaks.

The VCS is flexible, as it is not reliant on proprietary camera software and runs on a web-based client which operates in all modern browsers (Chrome, Firefox, Safari, Internet Explorer, etc.) from any office PC. Given the diversity of modern working environments and the expansion of many international airports, the system also offers a mobile app which allows the operator to remotely video encode from any location, which is beneficial in cases where fast deployment of staff is needed for remote encoding.



When installed, the camera images are run via an image pre-processor through to the image concentrator that interfaces with the Sort Allocation Controller (SAC). If installed on the existing ATR, the cameras can even run in parallel with the laser scanners. The process time for encoding each bag is fast enough to allow the bag to remain moving in the main system. The system can also make images available for attachment to various reports such as "no-read" reporting.

THE IMPACT OF VCS ON SCANNING OF HOME PRINTED, DIGITAL OR BARCODE TAGS

Cameras on an ATR have more features than laser scanners and increased functionality. One of the real benefits they have over scanners is the ability to identify a bag tag based on several camera shots instead of traditional barcode reading. ATR cameras can take up to 25 images of a bag tag with a total of 150 images using 6 cameras. The software processes every detail until a clear picture of the tag has been produced. An additional practical and environmental benefit is that cameras have fewer requirements for quiet zones.

The 2016 SITA report states that with the rise of passengers checking in online before arriving at the airport, home-printed bag tags as well as permanent digital tags are becoming increasingly common. The baggage handling industry will also begin to see the implementation of 2D barcodes, which work particularly well with camera imaging technology. These shifts in baggage tag types will begin to make traditional laser scanner technology obsolete.

TACKLING THE 'TRANSFER BAG' CHALLENGE

As with most operations in airports, time is the biggest challenge for handling transfer baggage. Analysis carried out by BEUMER Group revealed that within an overall connection time of 45 minutes, there are typically just seven minutes available for the BHS to process each item of baggage, with the process as follows:

- 18 minutes – aircraft to transfer belt
- 7 minutes – BHS processing
- 20 minutes – chute to aircraft

Airports are constantly looking to reduce connection times to service passenger needs. Where the airport/airline offers a 45 minute transfer window, if the inbound flight is delayed by 15 minutes, the passengers will still make it to their connecting flight, but the chance of their bags joining them is reduced. While most baggage is successfully handled by a fully automated process within these timeframes, there remains the problem of bags with tags that cannot be read by the automated system. Typically these bags are directed to a manual encoding station (MES) for processing and routing back into the system. This process can take several minutes and there is a chance these bags will not make it onto the flight in time.

For an airport, one of the biggest hurdles in baggage handling is the efficient processing of transfer baggage and, in particular, bags with crumpled or unreadable baggage tags.

Typically, transfer bags have a higher number of unreadable tags, so reducing this number is key to maximising capacity and efficient workflow in an airport's baggage handling system (BHS). The introduction of a VCS means that 50% of the baggage tag no-reads can be remotely encoded without being discharged for manual encoding, thereby saving valuable time for transfer baggage. Normally, the airport's BHS will divert bags with "no-read" tags to a manual encoding station (MES). Here, an operator will manually enter the missing information before re-introducing the bag into the BHS. This process means that each manually-encoded bag will touch the main sortation system twice, therefore introducing further delays and potential short-shipments, as well as having a direct impact on overall sortation capacity. Installed as a web-based application, the VCS allows operators to simply touch a screen to zoom-in to view no-read tags and quickly encode the bag tag correctly. This allows the bag to remain in motion within the BHS, therefore reducing the likelihood of short-shipments, inconvenience to the passengers and providing a reduction in short-shipment fees.

THE BENEFITS OF VCS TECHNOLOGY FOR SCANNING OF ARRIVAL BAGGAGE

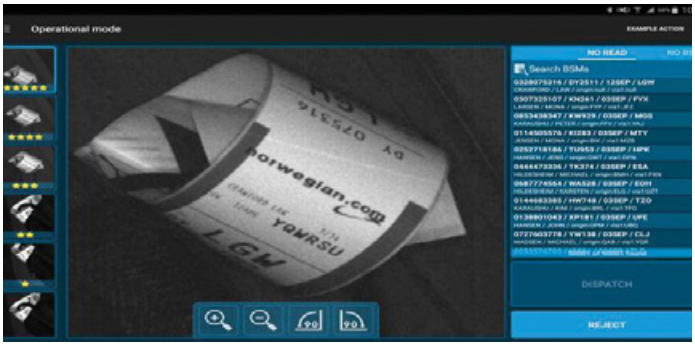
Cameras will most likely be the preferred choice for reading arrival baggage. Arrival baggage poses the same challenge with read rates as transfer baggage. Reading arrival baggage is an increasing challenge especially with the introduction of IATA resolution 753.The main purpose of the IATA Resolution 753 is to make sure that a bag has reached its correct destination and is reconciled with its rightful owner at the right time. To comply with this resolution, bags will need to be tracked by either automated readers or staff using mobile handheld devices.

Cameras can be installed on all arrival belts in the airport for non-readable barcodes to be processed remotely from a central VCS coding room. One VCS can resolve baggage tag reading for an entire facility, potentially including multiple airlines.

VCS TECHNOLOGY FOR SYSTEM AND MANPOWER OPTIMISATION

The introduction of camera and video scanning technology can also allow airports to optimise their baggage handling equipment efficiency and manpower. If the same VCS is used on both the inbound and outbound operations, the VCS can be centralised. This would allow the same operators to remotely read and code bag tags from both the inbound and outbound systems.

The VCS can also add an extra dimension of flexibility for airports because it addresses a baggage source message (BSM) black out scenario. For example, if a failure in a departure control system (DCS) means that the airport will not receive baggage source messages, additional staff can be deployed to encode the tags remotely by use of the VCS to prevent a bottleneck. A loss of BSM temporarily requires additional VCS operators, e.g. staff already carrying tablets with a VCS application, that allows them to log on to the VCS and help with encoding until the peak is reduced and the BHS can continue in normal operating mode. No fallback mode is required to deal with this situation. In this scenario VCS technology will help the airport prevent a potential die-back in the baggage handling system which would occur if the system has no destination for the bags.



CASE STUDY EXAMPLE

Copenhagen Airport has been using VCS technology for some time and the impact of implementing the BEUMER Group VCS has been dramatic, with the no-read tag rate being reduced to as low as 50% of the previous rate. It is estimated that the BEUMER Group VCS solution prevents up to 10 bags being short-shipped every day, allowing Copenhagen Airport to save around €100 for each short-shipment in addition to improving overall passenger satisfaction.

CONCLUSION

To raise the bar on handling baggage as a service, further optimisation of sub-processes in the baggage handling workflow is needed. Remote encoding is a solution that is easy to implement, and can have a positive impact on several of these processes as outlined. Remote encoding will take opmisation of the transfer bag process to the next level and help lower the rate of mishandled baggage.

The introduction of new technology or processes can be obstructed by cost implications however the return on investment is straight-forward when considering the implementation of VCS technology. For airports that already have cameras installed, the decision to make a business case for the VCS can be a natural development. However, in airports that have not yet implemented camera technology, the reduction in “no-reads” and short-shipped baggage cost alone can be enough to justify the investment in cameras.

To further encourage a move towards a wider adoption of VCS technology, SITA’s Baggage Report 2016 was able to confidently state, “The vast majority of bags are successfully delivered back to passengers at the end of their journey, due largely to the increasing effectiveness of technology aiding baggage management efficiency, despite the continued increase in passenger numbers.”

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Ident. no.: 10788-AA-600-V02-1EN-0217-SB-3866