

A TECHNOLOGY USED FOR POSTAL SORTING APPLICATIONS

MOSAIC™

Acquisition, reading and processing



Future postal solutions



MOSAIC™

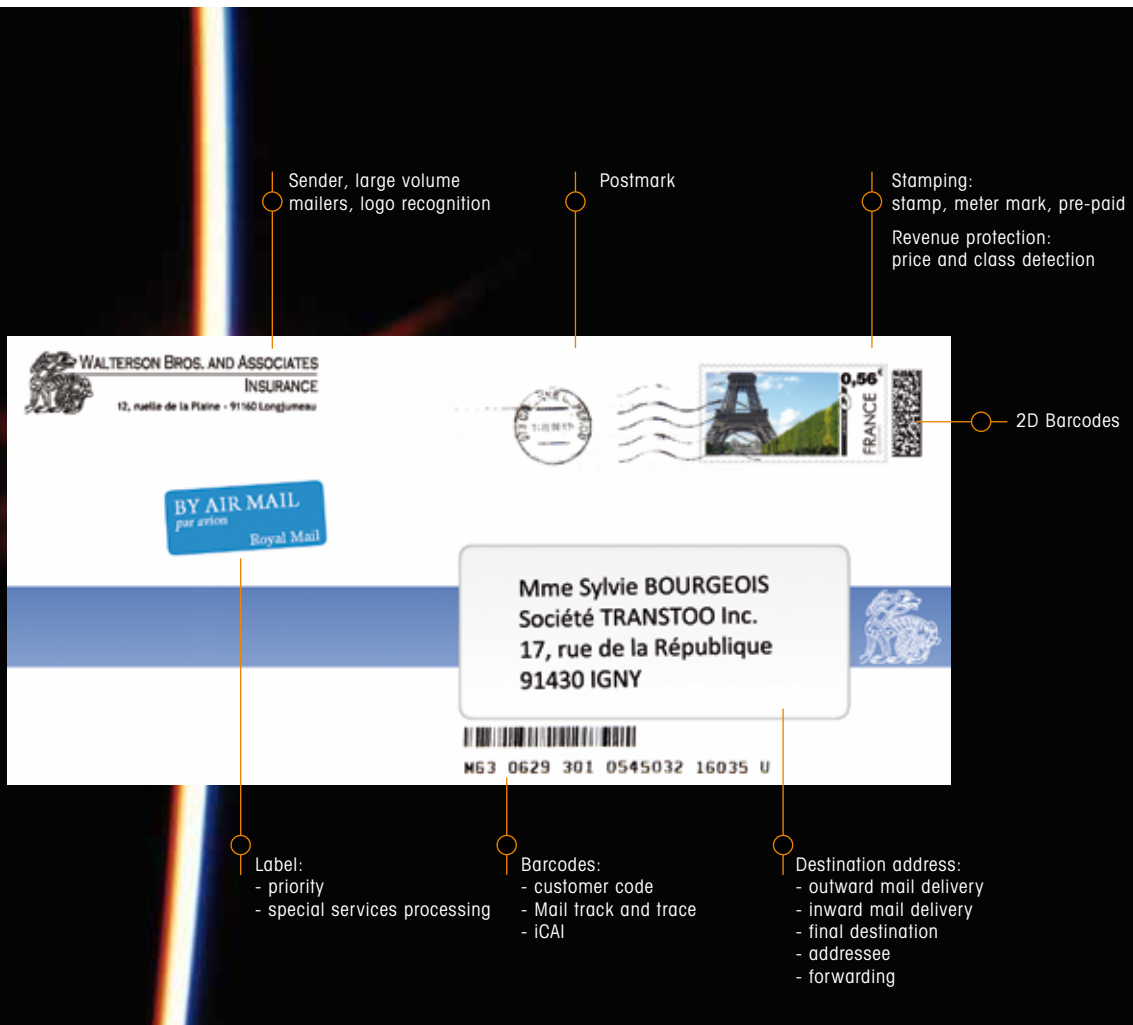
FULL OPTICAL POSTAL OBJECT PROCESSING

It was in 1983 that SOLYSTIC took its first steps in the field of optical address reading (OCR). Since then, the company has never ceased to improve the solutions it has to offer. Today there are more than 600 optical address readers operating across the world.

An indispensable complement to mail sorting equipment, MOSAIC™, by SOLYSTIC, offers a full range of tools and services for efficient mail processing.

Operating at the rhythm of the fastest sorting machines, the OCR system can just as easily read handwritten, as typed, horizontal, vertical, upside down or even skewed addresses. All sizes and formats of mail are accepted; from a postcard right up to a package. All the data required for the sorting process is then deciphered and transmitted to the machine.

If required, the automatic coding is complemented by a video-coding phase, which can be carried out either in local, remote centres or directly from the operators' home. The images are then displayed in greyscale or in full colour on flat, high-definition screens.



PERFORMANCE

1 Multiple OCR combinations

The high levels of OCR performance achieved by SOLYSTIC are obtained through the combined use of multiple, powerful, recognition engines.

2 Automatic learning

Thanks to advanced data fusion techniques, the recognition algorithms are optimised to assure permanent, high-performance reading.

3 OCR / Video coding Interaction

OCR and video coding are complementary components of the MOSAIC™ system. This interaction allows for coding performance levels 30% higher than a classical process.

4 V-Id™ : virtual ID-tag

Through the V-Id™ concept developed by SOLYSTIC, physical markings are no longer necessary. The condition of the mail piece is preserved and the operator saves money.

NEW SERVICES

5 Revenue protection

Based upon revenue protection, the new services offered by SOLYSTIC make the most of all the attributes found on an envelope (stamp, logo, franking mark, etc.)

6 Object tracking

Detailed information on each mail piece is available at all times, giving optimal control over the quality of service.

7 Mail forwarding

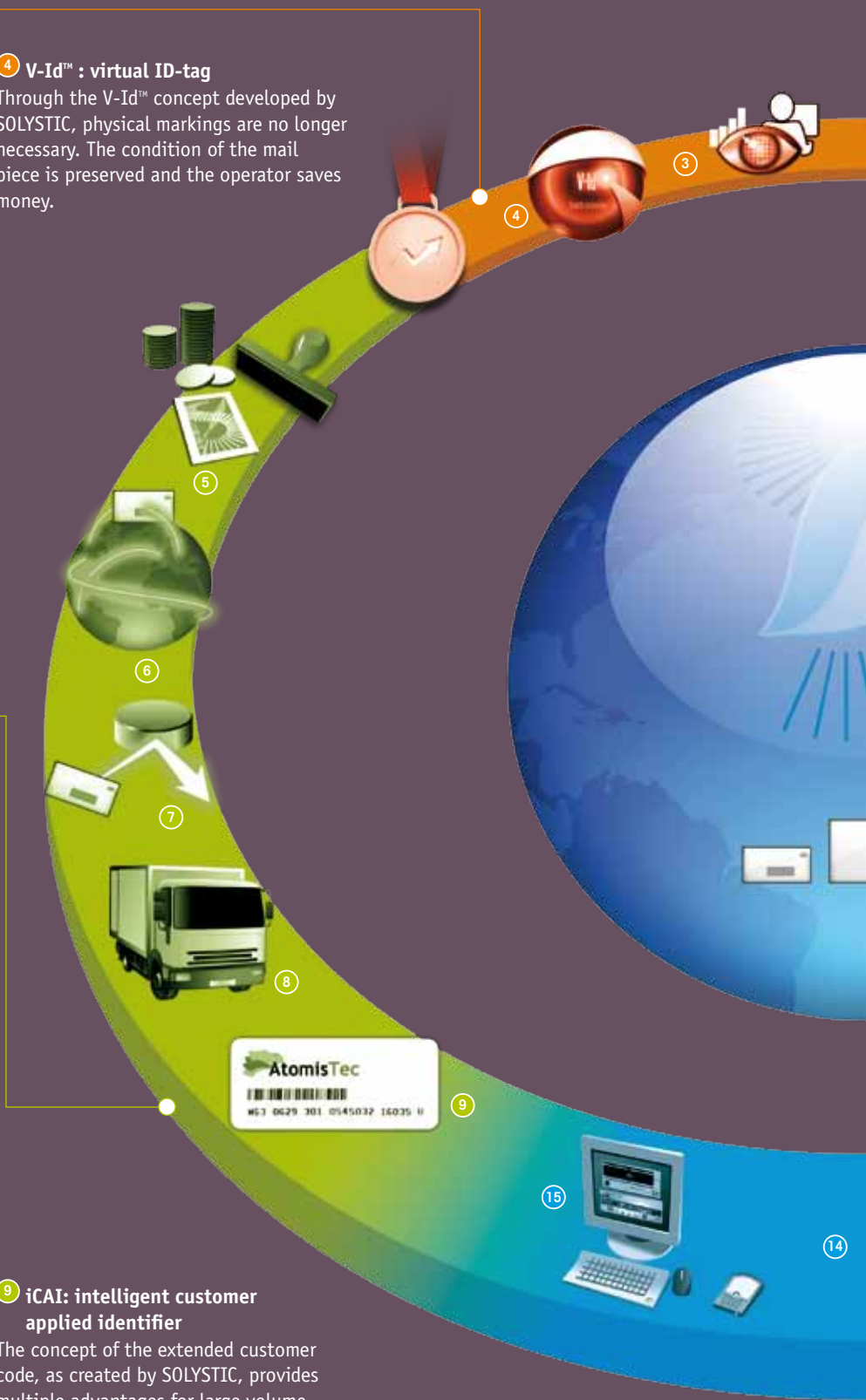
The complete processing of a re-addressed mail piece is completed during its first pass through the machine. The mail piece is then sorted in accordance with the new information.

8 Management of large volume mailers

The processing of the homogenous batches provided by large volume mailers is optimised by taking into account their own unique characteristics.

9 iCAI: intelligent customer applied identifier

The concept of the extended customer code, as created by SOLYSTIC, provides multiple advantages for large volume mailers.





WEB MONITORING

10 Web supervision
 A simple web browser is all that is needed to remotely access the MOSAIC™ system, to find out the status of each component and to optimise performance if required.

11 Maintenance
 High performance tools are available for the analysis of operational results and the efficiency of the video coding work.

12 Configuration
 The component parts making up MOSAIC™ can be configured through the web interface.

UNIVERSAL SOLUTION

13 Open system
 The open interface used with MOSAIC™ makes it easy to connect third-party components.

14 Flexibility / Adaptability
 SOLYSTIC's experience and the modular architecture of MOSAIC™ are guarantees of a rapid, efficient response to the specific needs of each customer.

15 Standardised hardware and environment
 MOSAIC™ has been designed from industry-standard elements, guaranteeing the long-term future and maintainability of the system.

Performance

PERFORMANCE APPLIED TO OPTICAL ADDRESS READING

All MOSAIC™ components work together to provide optimum efficiency. Thus, the global performance level of the system is higher than the cumulative sum of the parts.

ACQUISITION

An efficient system COPERNIC™ allows quality and optimized image acquisition for processing in grey scale and /or for colour recognition.

ADDRESS CODING

Multiple OCR combinations

SOLYSTIC's OCR system automatically and simultaneously transmits multiple images of a single object to different recognition algorithms. With the need for real-time processing in mind, the model integrates powerful, fully-functional software, associated with the most efficient OCR's available, developed by SOLYSTIC or third parties. The resulting combination, thus obtained, increases the read rate whilst decreasing the risk of confusion.

SOLYSTIC's OCR can be fitted as a complement to a customer's existing system; it thus becomes a secondary OCR system.



Automatic learning

Addresses are often complex, with the information included constantly evolving. With this in mind, automatic learning is essential for efficient reading.

SOLYSTIC's approach to this subject is to use techniques such as dynamic programming and neural networks.

STRONG POINTS

OCR/Video coding Interaction

In the majority of cases, the optical reader can recognise all information in an address. If this is not the case, the system generates hypotheses in order to request additional information. This is then transmitted to the video coding (VCS), which automatically selects the most suitable complementary task (for example, confirmation of the hypothesis, entering the number in a given road/street, partial input of the house number, etc.)

To improve efficiency, the system is optimised to present to the coders images requiring a number of repetitive tasks, however on a limited volume. After a few minutes, the operators are given a different action to undertake (e.g.: to localise the address block, enter a number, complementary information, confirmations, etc.), this means they always remain highly vigilant.

V-Id™: virtual ID-tag

The V-Id™ is an identifier assigned to the mail piece but not printed on to the envelope itself. It is recorded in a database. Each time the letter is processed in a machine, the image of the mail item is acquired; its V-Id™ is generated and compared with that already saved in the server. If the V-Id™ exists, the sorting attributes are provided by the V-Id™ server as if a letter Id was printed. V-Id™ provides numerous advantages:

- avoiding the bar-code printing thus respecting the mail pieces,
- reducing costs by eliminating the use of inks, solvents and applying labels to plastic wrapped items,
- reducing the number of maintenance operations,
- integration in a protecting environment approach.

The V-Id™ system can be applied to the processing of all postal items. All existing equipment is compatible with V-Id™.



The interaction between the OCR and VCS systems optimises processing time and returns coding performance levels 30% above those experienced by classic processing methods. In addition, this interaction between the two systems requires much less operator expertise.

New Services

ANSWERS TO THE NEW POSTAL CHALLENGES

REVENUE PROTECTION

MOSAIC™ is also equipped with other functionalities, used to process all other attributes found on an envelope: logo recognition, verification of franking marks, identification of mail class, pre-payment markings, etc. All this information can be used to propose new, "Revenue Protection"-based services.

OBJECT TRACKING

Mail piece information sorted by MOSAIC™ is saved to a database and used to:

- create operational statistics,
- provide detailed tracking of each mail piece,
- contribute to measure quality service or to help the administration of large volume mailers.

The information collected can also be exported in real-time to the customer's IT system, allowing them the freedom to use the information in their own applications.

MANAGEMENT OF LARGE VOLUME MAILERS

Large volume mailers generate batches of mail with identical characteristics. When these homogenous batches are fed into the machine the operator can select a suitable set of parameters, thus increasing the efficiency of the sort.

Optimisation is also achieved using the recognition module's functionalities, which constantly analyse the flow of images and automatically detects homogenous batches.

The operational savings are numerous:

- reduction in the number of errors (notably in the sender's address),
- increase in the read-rate by adapting automatically the settings to match the characteristics of the batch,
- activation of new services associated with large volume mailers (franking mark management, metering and statistics, printed address quality control, etc.).

MAIL FORWARDING

MOSAIC™ includes a mail forwarding function to deal with changes of address. Information on changed addresses is fed into the database on a day-to-day basis. The information can relate to a complete family or a single individual.

The complete process (recognition of a handwritten address, reception of the redirection request and extraction of the new address) is completed whilst the mail passes through the machine. The mail piece is then sorted in accordance with the new information.

The software and hardware used by SOLYSTIC supports high level of performance. The processing of data in colour, for example, allows the system to recognise stamps and process franking marks, even if the printing is of low contrast or on a noisy background.



ICAI: INTELLIGENT CUSTOMER APPLIED IDENTIFIER

SOLYSTIC has created the concept of an intelligent customer applied identifier (iCAI): large volume mailers print a bar-coded reference on their mail, giving instant access to the address description.

The advantages are numerous:

- increasing the read performance,
- updating of address databases,
- decreasing the number of UAA mail (“undeliverable-as-addressed”),
- re-direction of mail at the very start of processing,
- possibility of tracking the progress of the mail,
- avoiding the need for video coding.

SOLYSTIC has created the concept of an intelligent customer applied identifier (iCAI).

Web Monitoring

A SIMPLIFIED AND STANDARDIZED ACCESS

MOSAIC™ is monitored via a web browser interface. A server is connected to the various system components; it collects the data and makes it available to the operators so that it can be used to verify the status of the system and to analyse the performance.

WEB SUPERVISION

A basic internet browser allows connection, to know the status of each component, as well as to be able to optimise performance levels if required.

The principal data covers:

- system status,
- display of items being processed,
- software and database versions installed on each of the components,
- instantaneous throughputs and the read-performance of each OCR unit,
- a status of the videocoding activity,
- alarms and events management indicating that maintenance actions are required,
- operational statistics.

MAINTENANCE

The sampling function is used to quickly and easily build up test batches, recording the images and results of the OCR processing being carried out. These results can then be analysed off-line by a tool which accurately reproduces the operational OCR process.

The audit function can be used to check the quality of the coding being carried out by the operators.

Coders can be trained on either real or test mail. In neither case is the performance of the sorting underway adversely affected.

CONFIGURATION

The component parts making up MOSAIC™ can be configured through the web browser. It is possible, for example, to change the following parameters:

- optimisation of the assignment of OCR resources to sorting machines,
- assignment of video coders to the various coding tasks,
- taking into account a new version of the postal addresses database.



Universal solution

THE FLEXIBILITY AND THE EASINESS OF THE INTEGRATION

OPEN SYSTEM

SOLYSTIC has equipped MOSAIC™ with an open interface, meaning that third-party components can be easily connected. They can be integrated into one of SOLYSTIC's platforms or even into any other existing system. They are connected to MOSAIC™ via the open interface defined by the customer or using the standard CEN interface.

FLEXIBILITY / ADAPTABILITY

Thanks to its long and international experience in the image processing, SOLYSTIC has acquired an expertise in the diversity of worldwide mail. This knowledge, allows us to rapidly and efficiency adapt to the needs of each individual customer.

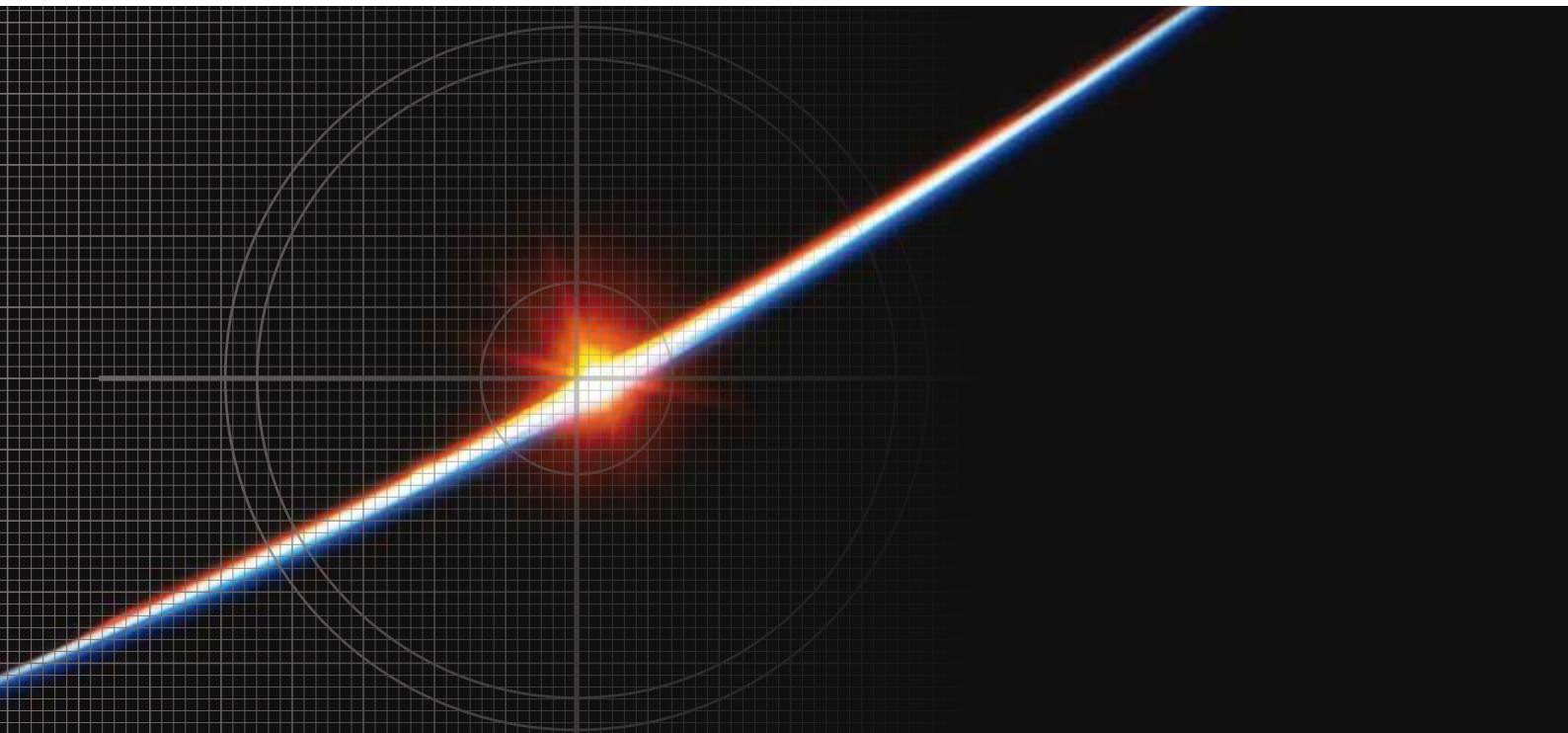
The modular internal architecture of the MOSAIC™ system gives a high degree of flexibility without sacrificing performance. Increasing computing resources or the addition of new components is facilitated by its architecture.

STANDARDIZED HARDWARE AND ENVIRONMENT

MOSAIC™ is designed using industry-standard elements:

- hardware components and architecture,
- programming environments and languages,
- operating systems and software components,
- standardized interfaces.

This choice assures the long-term future of the system, facilitating maintenance and reducing spare-parts costs.





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