

Global label demand
Asia/Pacific is gaining ground

Narrow WebTech

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BPIF labels

Automation in label printing

Dieter Finna/Geert Van Damme

There is a trend in label printing towards producing ever more complex products with shorter print runs and processing times. At the same time, the industry has to deal with high quality demands and aim for increased efficiency. Therefore, to handle print jobs in an economic way, creative software solutions for automated processing have been developed, enabling intelligent communication between the relevant working steps. The systems are fully integrated so data needs to be entered only once and then is available throughout the total process.

In label and package printing, the wide variety of print jobs requiring short processing times represents huge challenges for production, scheduling and processing including the challenge of in-time-delivery of all data, tools and material to the printing presses. To execute such complex tasks, systems are available to connect the individual processing steps.

Workplace automation is available today

Market leading companies, active in the fields of Management Information Systems (MIS) and workflow automation cooperated with

manufacturers of printing presses, systems for finishing and inspection and substrate suppliers to carry out an ambitious project aimed at the practical implementation of automated working steps. The goal was to fully network, highly efficient production. The advantages of such a set-up are described in detail in this article.

Ordering labels

The first step for a customer when ordering new labels is to upload the original artwork in the printer's web shop. The web backend transfers the customer's file into folders jointly used by the MIS and pre-

press department. After the data has been received, an automated preflight process starts which checks the quality of the data transferred and informs the customer automatically of the result. In case of error, the customer is asked to upload new artwork. In any case a detailed preflight report is made available.

The customer can then continue the data-entry by indicating the number of labels required, the delivery date and the delivery address. He completes the process by entering his purchase order number. After a few seconds, his order number is confirmed on screen and at the same time an email with the order acknowledgement is sent.

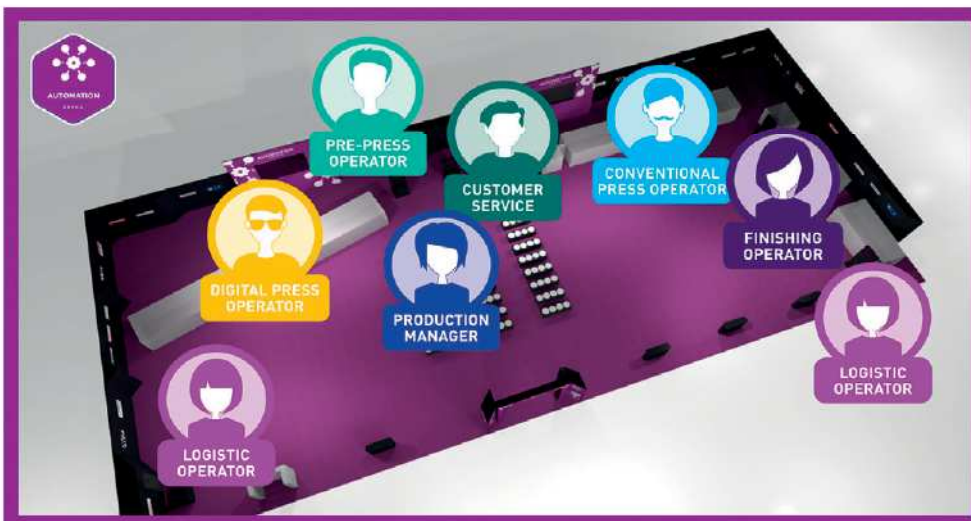
The pre-press approval workflow

Following the automatic preflight the pre-press operator will carry out some manual quality checks – for example checking overprint – on the new artwork and can intervene where necessary. When he has finished, he releases the workflow and a series of tasks are executed automatically. The new graphics file is uploaded, a new article is created, the product status is synchronized and the same article ID and its description are used for all subsequent process steps. Finally, a soft-proof e-mail is sent to the customer for approval, containing a link to an online preview of the artwork-file.

Approval for print

The preview of the print-ready PDF offers the customer the final opportunity to carry out a last check prior to online approval for print. In addition, he may check any differences to the original upload, for instance changes in the overprinting. After clicking the "Approval" button the order is ready to be processed by the Customer Service department of the print-shop.

Schematic draft of a label print shop provided with pre-press department, customer service, production management, and conventional and digital production and logistics as introduced during Labelexpo Europe 2017



Source: CERIN



Source: Esko

Customer service

New orders are displayed to the customer service department on a permanent basis. In addition, more orders can be entered either manually or by using the data import function.

If the customer has attached Excel or XML files generated by his own ERP system with the order, this data can be checked automatically and converted into new orders.

The major task of the Customer Service department is the checking of incoming orders with regard to correct pricing or available stock.

For all approved orders without stock availability Customer Service now activates the production-wizard which suggests, as a first step, the most economic manufacturing process. For example, in choosing a digital or a conventional workflow, based upon cost. However, when necessary, Customer Service can change the recommendation of the software. Subsequently all production jobs are created, scheduled, and prepared for production.

The pre-press step & repeat

The production jobs are now available for all manufacturing steps and are shown in the job-queue of the pre-press operator. At this stage, automated processes have already started.

If a product is not yet approved, the workflow is put on hold until approval has been received and only then can the process automatically continue. If the operator needs to check or approve the pro-



Source: CERN

cesses prior to the final execution of production instructions, he will be prompted by the software.

If a job consists of a series of generally similar labels which are slightly different, for example in background colours, a conversion process running in the background converts the original colours into a fixed inkset, like CMYK or extended gamut. This enables the printing of all labels of a series using just one set of plates.

Simultaneously additional files are created such as the layout for the die-cutting tools for the subsequent ordering via the MIS system.


Based on the required quality level, the appropriate level of in-

Left: The processing steps including pre-flighting, quality control, proof-printing and customer approval are carried out using the Esko software platform containing the Automation Engine


Right: The sponsoring companies not only worked together for the pilot project but also for its successful realization in practice

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Source: Matho

spection is chosen and the inspection data for the camera system is prepared.

The production

The production manager receives a job-list, based upon an in-time-production and he checks the status of artwork, tools and materials required. He then decides on the production-sequence per press by grouping the jobs, for example by substrate. In the next step he releases the job for production by sending the electronic job tickets to the printing press. Following his approval of the timetable for production an order confirmation is sent to the customer via an automatically generated e-mail.

According to the predefined material requirements, the print-shop logistics staff take the substrate-rolls out of stock and prepare the required tools, plates and inks according to the order. All these tasks are instructed and guided by the MIS system. This also includes core cutting. The cores will be provided in containers marked

with job-specific barcode-labels after cutting.

Before production begins, the press operators receive specific job instructions such as job description, substrate specification, and material quantity. In the case of repeat orders, all the job parameters are automatically set by uploading the setup file of the previous production (as indicated by MIS). In

“After production begins, the printed web is inspected and all print errors are stored in the system.”

addition, the MIS also sends instructions to the camera inspection system on the press.

The operator changes the print cylinders with the pre-mounted plates and subsequently activates the automatic print control procedure. The setup of the lateral and the longitudinal register and the impression pressure requires no operator invention. After production begins, the printed web is inspected and all print errors are stored in the system. Upon comple-



Source: Dieter Finna

tion of the print run, the semi-finished reels are identified with a barcode and transported to the offline finishing equipment.

The finishing operator scans the barcode label of the job to upload the electronic work instructions for two further processing steps: The automatic positioning of the cutting knives and the rewinding of the finished reels. The knives are moved into the required position within seconds. Simultaneously, the operator positions the pre-cut cores on the semi-automatic turret re-winder and attaches double-sided adhesive tape.

The operator activates the inspection workflow system by scanning the barcode of the semi-finished roll and then starts the machine. The system recalls the errors registered while printing and the finishing machine will automatically be stopped at the error-position and the error indicated on the screen. This enables the operator to

Left: The edge trim is captured, transported and collected by the Matho EM180 disposal system

Right: DThe printing process has been carried out with an MPS EF 430 eight-colour UV printing press with smart print adjustment monitoring

Left: FA Xelkon 3300 press has been used for digital printing

Right: The reel-exchange was carried out using a UR Precision 440U nonstop gluing device by Kocher + Beck without waste



Source: Xelkon



Source: Kocher + Beck

remove the bad product(s) from the reel. During the cutting process, the operator prints out a finished product roll-identification label provided by the MIS and applies a label to all individual rolls.

Logistics and invoicing

The shipping department can now directly ship the finished rolls or store the products in stock by scanning the roll-ID-barcode and the barcode of the storage location. For direct shipment, the operator prints out a picking slip and scans all rolls to make sure that the correct products will be delivered. In addition, a shipping box label is printed. After picking, the delivery note for the customer is generated. As soon as the shipment has left the company, the customer is automatically notified by e-mail with a tracking code and delivery note attached. To generate the invoices for the shipped orders, the customer service selects all the orders shipped "today", generates and checks the invoices which are then sent to the customers by e-mail.

Conclusion

All relevant administration, planning and production processes are integrated into a streamlined and automated workflow. There will inevitably be practical examples when individual order processing steps do not happen as described. However, this project indicates the advantages of a fully automated workflow in a clear and practically relevant way. It is an impressive demonstration of the speed of an automated order- and production workflow. The integration of the plate-making processes for conventional printing in an automated flow has not been mentioned in this article, as this is already a standard in day-to-day production. Altogether, the automation of label printing as described in this article is a fully oriented scenario which can be used by many label printers in the future.

References

^[1] The Automation Area, Geert van Damme, Presentation during Labelexpo Europe 2017

An overview: work procedures & modules

The upload of graphics and the steps for order processing takes place within the Cerm MIS system. This includes modules supporting each processing step within the integrated workflow. The processing steps which include pre-flighting, quality control, proof-printing and customer approval are carried out using the Esko software platform "Automation Engine". The MIS merges the orders into complete jobs and the Step & Repeat is prepared. The availability of the respective materials and tools required is checked by the Cerm scheduling tool and ordered if necessary. This is followed by transferring the JDF files to the production press, which in this instance is an EF 430 eight-colour UV press supplied by MPS and provided with a smart impression pressure adjustment device. At the same time jobs can also be sent to a Xeikon 3300 digital print engine. The reel-exchange is carried out using the UR Precision 440U nonstop gluing device supplied by Kocher + Beck. During the print run, the AVT Helios inspection system detects missing areas in the printed products which are then removed by the Grafotronic H12 slitter/rewinder. The edge trim is captured, transported and collected by the Matho EMI 80 disposal system. The data for the delivery note and the invoicing are supplied by the Cerm system. The substrate for the pilot project was provided by Avery Dennison and the inks by Flint Group Narrow Web and Zeller+Gmelin.^[1]



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