Leinebergland Druck GmbH & Co. KG

Industriestrasse 2A
31061 Alfeld
Germany
Background

With this new application for a CIPPI Award we are keen to stress our continued efforts to comprehensively optimize our production processes. We aim to prove that the strategic decision to opt for JDF was the right one and that this format is feasible for SMEs, too. We therefore include details on additional savings that have been confirmed or identified since our last assessment.

We have italicized the additions to highlight them, and two graphics have also been revised.

For 20 years, we have been supplying publishing companies, trade, and industry with the full gamut of graphic arts services. Top-quality printing, speed, flexibility, targeted consultancy, a personal service, and a real sense of partnership are all incorporated in our “High Printality” concept.

History of Leinebergland Druck

1987: Founded and initially offered small-format offset services
1992: Purchased a Ryobi single-color A3 press
1997: Switched to a Speedmaster SM 52-2 from Heidelberg; first system with polyester CtP technology and Delta RIP
1999: Built the new factory and moved into the new building; bought a Speedmaster SM 52-4 with CPC 32 (CIP3) from Heidelberg (still in operation today)
2000: Introduced Winkaar job costing software (now Prinance)
2001: Bought a Speedmaster SM 74-4 and Topsetter 74 CtP system from Heidelberg
2002: Established own postpress operations with the KI 55 folder and Heidelberg ST100 saddlestitcher; factory extended
2004: Started printing in A1 format; the Speedmaster CD 102-4+LX with Image Control replaced the SM 74-4 and an investment was made in the Prinect Printready workflow with the Trendsetter 3244.
2006: Initiative to improve efficiency and bring about JDF workflow integration.
2007: New Suprasetter 105 CtP platesetter replaced the Trendsetter 3244
2008: Certification to ISO 12647-2 (PSO – German process standard for offset printing)

We currently generate annual sales of €2.6 million with a total of 22 employees.
Situation prior to integration

Prior to integration in 2003, our company was in a situation that was undoubtedly typical for an SME of our size. The Prinance job costing system introduced back in 2000 was used by one specific member of staff. The administrative and prepress networks were separate and, consequently, digital data transfer was not possible. There was no system for optimizing production planning and the utilization of resources. Feedback and status information had to be actively sought. Integrated actual costing was not possible. Each individual costing had to be processed manually for invoicing purposes. It was not possible to provide customers with documentation evidencing work relating to production.

There were 6 prepress staff working in a single shift. The Delta Technology workflow and the Topsetter 74 CIP platesetter from Heidelberg Druckmaschinen were used for plate production. Data preparation involved a large number of consecutive manual steps. Data was also validated manually, in some cases with additional tools that were used as required. The prepress network was separate and did not enable digital connection to upstream or downstream production steps. There was little automation of the PostScript workflow. Every printing form had to be processed manually using Signastation. Long computing times in the RIP often led to lengthy waits and jobs being delayed. Additional data processing costs were only recorded on a sporadic basis in the form of notes on the printed job ticket.

There were 6 press staff working in 2 shifts on a Speedmaster SM 74-4 and a Speedmaster SM 52-2. Conventional job tickets were pre-sorted by the planning department and then processed. We soon recognized the benefits of automatic ink zone presetting and invested in Prinect Prepress Interface from Heidelberg back in 1999 when we bought the Speedmaster SM 52-4. However, the Prinect Prepress Interface workstation was incorporated in prepress operations because the
pressroom was not yet networked. Data was transferred to the press “on foot” by flashcard, and the Speedmaster SM 52-2 was not equipped for networking. No additional information, such as data on material and run length, was transferred. Electronic production data acquisition to obtain job- or operation-related evaluations was not possible either.

Postpress invoicing was based on pre-calculated values. This can lead to shortfalls, in particular with manual work. Actual performance and quantities could only be recorded in a time-consuming process involving dockets.

Fig. 2: The digital workflow prior to integration
Disadvantages of the situation

• Management:
  o Job processing very time-consuming
  o Complex material planning
  o Administrative bottlenecks
  o Integrated actual costing not possible

• Prepress:
  o Large number of manual steps involved in data preparation
  o Complex troubleshooting in data supplied
  o No automation – each printing form has to be handled manually
  o Manual work leads to errors
  o Long RIP times mean that staff have to wait
  o No performance measurement

• Press:
  o Manual job preparation leads to long makeready times
  o Manual job preparation results in errors
  o Color presetting via CIP3 only, no transfer of additional data
  o Time-consuming reading in of CIP3 data from flashcards
  o No performance measurement

• Postpress:
  o No quantity measurement, too little/too much supplied as a result
  o No performance measurement
Objectives
Objectives — goals and motivation:

Quantitative goals:

• Management:
  o Increasing the sales volume through automation and integration of the various systems for optimized work processes
  o Cutting the time required for administrative tasks (searches, job planning etc.)
  o Reducing turnaround times
  o Implementing actual costing for analysis and evaluation

• Prepress:
  o Automating plate production
  o Increasing productivity and capacity utilization
  o Reducing the number of manual steps in data processing
  o Reducing the error rate
  o Implementing performance measurement

• Press:
  o Increasing productivity and capacity utilization
  o Minimizing processing times
  o Reducing the error rate
  o Implementing performance measurement

• Postpress:
  o Implementing performance and quantity measurement

Qualitative goals:

• Management:
  o Production transparency
  o Real-time business evaluations
  o More time for customer support

• Prepress:
  o Improving plate quality
  o More time for technical customer support
  o Implementing color management

• Press:
  o Implementing a coloring standard
  o Improving printing quality
  o Extending the range of services (coating, scented coating etc.)

• Postpress:
  o Extending the range of services (die-cutting, mailing, fulfillment etc.)
Methodology

Methodology — alternatives, selection criteria and decision-making process:

Decision criteria for the introduction of a workflow system

The workflow system must

- Be based on JDF and PDF and offer a high level of automation
- Cover the entire production process:
  - Prepress modules
  - Press integration
  - Postpress integration
- Support connection to a management information system
  - As much data as possible should be made available to production for job creation, presetting, and automation
  - It must be straightforward to integrate the existing equipment
  - Feedback of machine and production data must be supported
- Be open and easy to upgrade (standardized JDF interface) to ensure that the system can be developed further in the future (integrating new machines etc. into the workflow)
- Enable quality control and assurance products to be integrated (color measuring devices)
- Ensure the supplier’s service quality
- Offer a good cost/benefit ratio

The following workflow systems were evaluated using these criteria (in 2004):

- Prinect Printready
- Creo Prinergy

Since only Prinect Printready met all requirements at the time, we decided in favor of this system. The main arguments were as follows:

- High level of automation in Printready
- Sophisticated JDF interface (especially with Prinance)
- Sophisticated JDF architecture that extends beyond prepress to press and postpress
- Good past experiences with Heidelberg service
Implementation Story

Integration milestones

Step 1 (2003): Start of the integration project with production data acquisition via Stratos iPoint terminals in prepress, press, and postpress. Following consolidation of the printing machinery, the terminals in the press department are to be replaced by the production data acquisition function integrated in the CP2000 control station.


Step 3 (2004): The Speedmaster CD 102-4+LX replaces the SM 74-4. The Trendsetter 3244 platesetter replaces the Topsetter 74 to cater for the larger plate format.

Step 4 (2005): Prinance MIS connected to Prinect Printready. Jobs are now created in the prepress workflow system at the touch of a button thanks to JDF. SignaStation automatically evaluates sheet geometry and selected folding layout.

Step 5 (2006): Speedmaster CD 102-4+LX connected to the network. Speedmaster SM 52-4 upgraded with the Prinect Online Kit, replacing flashcard exchange between presses and Prepress Interface and enabling job and presetting data to be loaded online.

Step 6 (2006): Prinect Integration System installed. All job and presetting data can now be loaded from a single data source. The Prinect Cockpit provides a comprehensive overview of production. The Prinect Pressroom Manager module replaces our existing Prinect Prepress Interface.

Step 7 (2007): Production data acquisition via Prinect Pressroom Manager/Prinect Integration System directly from the Prinect CP2000 control station. This replaces the Stratos iPoint terminals used on a temporary basis. Accurate production and press data is now available for actual costing.

Step 8 (2007): Following installation of the new CtP platesetter, quality management in accordance with the German process standard for offset printing (PSO) was introduced. Implementation is based on ISO 12647-2 and involves defining tools and processes at the prepress stage and in the printshop, and staff training.
Next steps:

- Creation of an online portal for customers featuring inquiry and quotation management functions and job and document archives. It is planned to connect Prinance to the ASP solution FACEPORT from alphagraph team.
- Extension of the JDF workflow to postpress
- Introduction of the electronic planning board as an integral part of the JDF workflow

**Resulting Workflow/Processes**

**Situation following integration**

The main developments at our company following integration were the increase in the maximum printing format from A2 to A1 made possible by investing in the Speedmaster CD 102-4+LX and a production increase of close to 40%. In order to cope with this, we had to boost productivity in all areas of production and make changes to our organization and job management. Our initiative to improve efficiency and establish an integrated workflow played a key role in this respect. Two employees who used to work in prepress are now project managers in job management. Their practical production knowledge is very helpful to them in their work.

Communication between job management and production has improved. The Prinect Cockpit and the status monitor in Prinance provide a comprehensive overview of production.

The Prinance costing system is now linked to Prinect Integration System via the JDF Connector. Jobs are now created in Printready at the touch of a button. SignaStation automatically evaluates the sheet geometry on which costing is based, along with any folding layout selected, and uses this data to create an impositioned sheet. SignaStation often used to create bottlenecks, but it now works automatically in the background for standard jobs. Predefined processing steps control data validation, page processing, and plate output. PDF processing results in much better reliability in production than the PostScript workflow. With the Preset Point module, the calculation of area...
coverage values for ink zone presetting is now an integral part of the workflow and can be viewed at all workstations.

Following approval and plate output, Prinect Integration System makes jobs available to the presses. The operator at the press control station can load all job-related data with a click of the mouse for job preparation. The Speedmaster CD 102-4+LX came with the network-enabled CP2000 control station, but the Speedmaster SM 52-4 had to be upgraded using the Prinect Online Kit. Previously, the only way to obtain ink zone presetting data from Prinect Prepress Interface was by using a flashcard. Now, press and production data for status messages and performance measurement is supplied during normal press operation by pressing specifically assigned buttons.

In postpress, workflow integration is used to provide electronic feedback on performance and quantities. Further work is required before automatic machine presetting is possible, and this is planned for a future integration stage.

The introduction of machine and production data acquisition in prepress, press, and postpress enables users to call up ad hoc information via production and prepare long-term statistics. Ad hoc information enables us to react quickly to problems or changes in production, while long-term statistics provide us with information on aspects such as performance in individual operations or on the job structure. Permanent verification of costings is also possible.

Fig. 4: 2008 workflow
Advantages of the situation

- **Management:**
  - Automated actual costing based on “real” performance data is possible; additional outlay become transparent for the customer and can be invoiced
  - Fast and clear overview of production capacity utilization
  - Production can be planned
  - Ad hoc information is available
  - Long-term production statistics are possible
  - Daily actual costing with up-to-date production data acquisition details
  - Permanent verification of costings
  - Statistics direct from the production system with Analyze Point

- **Prepress:**
  - Automatic job transfer from job management
  - Automatic PDF processing, automatic impositioning and plate output.
  - Job data from Prinance is available directly in Printready
  - No waiting times or prolonged searches thanks to centralized data management and an automated workflow
  - Electronic performance measurement with Stratos iPoint

- **Press:**
  - CP2000 is provided with all job and presetting data from Prinance
  - The error rate is close to 0
  - No waiting times or prolonged searches during job preparation
  - Accurate performance measurement directly at the press control station
  - *Much shorter makeready times*

- **Postpress:**
  - Job data from Prinance is available at Stratos iPoint
  - Electronic performance and quantity measurement
Best cost/benefit

Best cost/benefit realization — quantitative analysis/ROI and qualitative results

JDF integration has led to a significant increase in productivity in job management, prepress, and press. The effect is particularly noticeable in prepress, where the improvement was achieved despite cutting the number of operating personnel from 6 to 3. The production capacity freed up through the consistent expansion of sales and job management could be used directly for additional jobs. The modified cost structure resulting from the changeover to a larger printing format shortly after workflow integration started must be taken into account in the ROI evaluation.

The prepress improvements also had a noticeable effect on pressroom productivity due to enhanced reliability in production and the prevention of machine stoppages in the pressroom. Although CIP3 ink zone presetting had been used for some time at the company, a further reduction in press setup times was achieved by taking data from prepress and the industry software. A key factor here is the fact that data is available online at the press and no longer has to be read in from the flashcard.

Accurate real-time actual costing is now possible for every job thanks to the introduction of machine and production data acquisition in prepress, press, and postpress. Work done can now be documented and billed to customers whereas, in the past, reductions sometimes had to be made. In job management, feedback providing status information has significantly reduced the amount of job planning and administrative work. We expect a further improvement once a planning board integrated in the production system is available.

The quantitative effects of Image Control have not yet been included in the calculation because a predictable effect and further savings resulting from integrated quality control cannot be evaluated until the introduction of Prinect Color Solution.
Business developments and production conditions in 2007 led us to carry out a new economic assessment, and we have incorporated the results in a revised calculation.

The sales and job management benefits are clearly confirmed. They are the result of the time saved for an average of 2,300 jobs per year and additional profits from services carried out by us which we were able to charge customers for. These additional services for approx. 5% of jobs would have remained uncovered prior to integration. The increase in the number of jobs handled is taken into account for each year. The number of printing forms has increased more than the number of jobs over the past few years. Without JDF integration, this would have resulted in production bottlenecks.

In prepress, we coped with the increased volume using existing resources and were even able to streamline further. Since 2007, an in-house prepress employee has been responsible for network management. In press, we noticed a marked improvement in efficiency following the introduction of quality management in accordance with the process standard for offset printing. This was not included in last year’s assessment. Makeready times at the press have been cut by a further 25 minutes on average. Since these quantitative effects were achieved with our JDF workflow and the associated tools, they should be included in the economic assessment. The cost basis for the calculation was adjusted to take into account the additional costs of the CD 102-4 press with Image Control compared to the old SM 74-4 (additional leasing costs). This also includes the additional costs for the larger printing format.
### NPV (net present value) and ROI (return on investment) calculation

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<th>Discount rate 6%</th>
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<th>2006</th>
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<th>2008</th>
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<td><strong>ROI (return on investment in %)</strong></td>
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Conclusion

The revised economic calculation with an \textit{NPV} of €1,539,744 and an \textit{ROI} of 800% confirms that JDF integration is the key factor in our restructuring and cost-cutting strategy. The result is all the more impressive for a company of our size because the potential for rationalization is not as great as at a large company. It is increasingly important for our company to use every potential saving available to successfully combat the price pressure in the printing industry.

The project’s different phases meant that we initially achieved savings and additional effects in job management and prepress. The Prinect integrated JDF workflow system made it possible to improve the processes we had identified as being problematic. Major savings were subsequently made by implementing the fully integrated Prinect color workflow. We already suspected this would be the case during last year’s assessment and it was confirmed in the course of the integration project.

We were also reassured that in Heidelberg and alphagraph we had chosen the best possible partners for full integration. There are several reasons for this:

- As a small company, we benefit from the efficient Prinect integration platform. Greater outlay for automation would lessen the effects achieved.
- Heidelberg ensures the JDF compatibility of the numerous interfaces in the Prinect system.
- The modular Prinect system is growing quickly, which means that we also enjoy ever greater benefits.
- The excellent cooperation between the suppliers Heidelberg and alphagraph benefits us directly when it comes to JDF integration of Prinance.
- Professional implementation and an excellent service.
- Both suppliers are long-term partners.

Building on the progress made to date, the next planned integration phases are in production and involve the extension of the JDF workflow to include postpress and the introduction of the electronic planning board as an integrated JDF module. In job management, we will greatly improve customer communication by setting up our online portal.