2009 Winner
CIP4 International Print Production Innovation Award for
Most innovative use of process automation technology in an implementation

And

2009 Winner
CIP4 International Print Production Innovation Award for
Best Process Automation Implementation — Asia Pacific

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Japan
Executive Summary — Shinkosha Printing Co. was founded in Kanda, Tokyo, in 1919 and moved to its present location in Sarugaku-cho, Shibuya, in 1927. The present head office and plant occupy a 3-storey building on approximately 660 m² of land, with the printing plant on the ground floor, DTP and plate making on the second floor, and sales and computerized composition on the third floor.

We posted sales of 800 million yen in 2008 and have 50 employees. Our key feature is not so much its sales as its very high profit margins.

Shinkosha’s main business is printing medical books, engineering books and other academic books and magazines. The characteristics and problems of printing medical and engineering books are, first, the time frame from receipt of the order until delivery is longer than for other general printed matter. Printing an academic book takes six months on average. Sometimes it can be as short as three months or as long as twenty years. Naturally, when a book has to be set aside for a long time, the difficult issue of making advance payment of costs including personnel expenses and juggling finances arises. Manufacturing costs, therefore, have to be minimized by cutting down waste and excess. Second, there is the problem of printing precision and correction. With any book, but especially with medical books, there is no margin for error. For example, just placing the decimal point for the amount of medicine to be administered one place to the left or right could affect the condition of the patient being treated. Meticulous printing precision and proofreading are essential. A book will contain a considerable number of plates and photographs, but pictures of diseased parts, for instance, must be as close as possible to the actual human body part in colour and tone. Scrupulous attention must be paid to the slightest speck of dust, scratch or dot. Naturally, proofreading is performed by the author, and as proofreading can be required up to four times on average, any unreasonable burden on the author must be avoided as well as any wasteful processes that would double our workload. Third, most printing is high-mix low-volume, so data accumulation and management are very important. Revised editions are now released in a 3-year rather than a 5-year cycle, but if the illustrations and photographs are compiled into a database, they can be used for the revised edition without needing to be obtained from the author, a major advantage both physically and in terms of time.
Shintaro Fukuda, the president of Shinkosha Printing Co., has been working on the reform of the above-mentioned issues since around 1995, reviewing the entire operations of the company with digitalization as his keyword. As mentioned above, the issues in printing medical and engineering books are: 1) improvement of work efficiency at the printing data creation and correction stages and shortening of the schedule time, 2) ensuring stability of printing quality such as colour and tone, and 3) construction of a database for high-mix low-volume production. These three requirements are interrelated. The history of Our printing workflow digitalization started in 1996 with the introduction for the first time of manroland 700 which supports MIS software, Olive’s PrintSapiens and CIP3/PPF, and Pecom controllers. Since the launch of CIP4/JDF in 2001, workflow automation has been conducted in a 4 to 5-year cycle with devices and software being continuously added or changed. In July 2008 we starting using manroland’s Japanese-supported Pecom controllers, completing the consolidation of the management environment for internal operations from planning, editing, design, plate making and colour proofing to printing, and achieving considerable success in raising productivity and enhancing customer satisfaction.

Section I. Background — We always strive to introduce the latest equipment and build the latest environment. We started to automate our printing processes in 1996 and the following is a review of our achievements to date.

1996-1999: Full automation of printing machines
- Made preparations to introduce Olive’s PrintSapiens MIS (Management Information System)
- Introduced manroland’s Roland 700 printing machine in 1996 and achieved full automation of printing machines (CIP3/PPF) with PECOM Network

2000-2003: Remote machine presetting and group control
- Introduced a second Roland 700 in 2000
- Adopted manroland’s Windows-based PECOM Network software; Prepresslink, JobPilot and PressMonitor at the same time
- Introduced Screen’s CTP (Computer to Plate) in 2001
- Introduced a third Roland 700 in 2003
2004-2007: First step of JDF based integration workflow which can track real-time entire plant.

- Switched to Screen’s CTP PRT8800 in 2004
- JDF-capable PrintSapiens and TrueFlow
- Added JDF connectivity and added automatic job search and job create software

The JDF environment built from 1994 to 2007
Section II. Objectives — One thing we have learned through our experience over the past ten years or more is that we must keep on changing all the time to ensure stable sales profit. Only by continued growth and development can we maintain our high profit capability. That is to say, to respond to the dramatically changing business environment, we decided to review our existing approach and to complete a further challenge of the issues below by the whole company by the end of FY2008.

Future printing business points

- Low prices and high profits: The era of low margins and high turnover is over
- High added value and high unit price: Printing services that afford high customer satisfaction
- Daily settlement basis: Calculated each day
- Single-item profit basis: The era of taking profit from a loss is over. Everything is on a cost basis

What is required of printing business

- Efficient order receipt: Efficient estimation
- Order management: Reduction of internal tasks after receipt of order
- Pre-press: Downsizing by automation
- Press: Abolition of 3-shift system and reduction of material costs
- Performance reporting (profit and loss calculation): Promotion of efficient calculation and clarification of no solicitation

Process calibration

- Reduction of printing preparation time: Reduction of material costs
- Maintenance of printing standardization: ICC profiling
- Increase in orders received: Double work volume by reduction of printing preparations
- Reduction amount (including increased orders): Key to successful integration

Five thorough measures

- Thorough execution of plans: Leadership, follow through to the end
- Thorough reporting: Related staff, reporting, informing, advising
- Thorough implementing: Redefining of work duties, follow through to the end
- Thorough follow-up: Training, education
- Thorough review: Related staff, redefining of work duties

Section III. Methodology — To achieve the objectives mentioned in Section II, we had to define the prerequisites for our efforts.

We focused on the following as the basic premises of full digitalization of the entire environment

- Promotion of efficient production and networking within the company
- Need for a “total optimization”, not a “partial optimization” response
- Group control, not individual control
- Digitalization is essential to ensure stable printing quality

Points we focused on to achieve the objectives

- Minimum time
- Minimum cost
- Minimum risk
- Linked to next reform
- Linked to future expansion
The conclusions we reached after considering the above premises are as listed below.

- Uniformity of all printing machines (same size and same manufacturer)
- Adoption of fully automatic printing machines
- Adoption of printing machines with quality control device
- Uniformity of printing plates and paper? (same size)
- Uniform procedures can be achieved as a result

Section IV. Implementation Story — The US and Europe are leading the way in promoting standardization of CIP3/PPF and CIP4/JDF. For us, language is a major hurdle to our keeping pace with such standardization. Whereas English and German, for example, are 1-byte languages, Japanese and Chinese are 2-byte languages. With the spread of the internet, Unicode is used as the standard character code and it is only very recently that the 1-byte/2-byte problem is beginning to be resolved.

Consequently, 1-byte/2-byte is still a problem in the historically long-established printing industry. But with the conspicuous economic growth of Japan and the Asia Pacific region and the rapid development of the printing industry, Asian language compatibility has accelerated among printing equipment vendors in the USA and Europe.

With regard to our major objective “to achieve total compatibility with JDF-enabled equipment by 2-byte (Japanese) support by manroland’s PECOM Network”, JDF connectivity with PECOM Network and Olive’s PrintSapiens MIS software was announced at drupa 2008 in Germany last year, with the result that we were able to commence actual operation in June 2008.

The operating status of each printing machine can be monitored on the PECOM press monitor.
As for our second objective “to introduce Konica Minolta’s Neostream Pro pre-press production control support system and link DTP/design division operations via JDF”, calculation of DTP man-hours in the management division was made possible by digitalizing man-hour tracking in the production division where medical books and engineering books require repeated proofing and seamlessly linking with PrintSapiens MIS software via JDF/JMF.
What tasks did the DTP Operator do Today

Neostream Pro User Interface

Printsapiens receive the data from Neostream Pro.
Section V. Resulting Workflow/Processes — PECOM Press Center and Neostream Pro were connected via JDF/MJF in 2008, completing the workflow and enabling close integration of the production equipment and control system. By building the aimed-for network group control environment, we are able to track the progress of every task in the company, the operating status of all equipment and the occurrence and cause of problems from any location in real-time.

Workflow integrated in 2008
Work instructions can be issued, history managed and performance reported from PrintSapiens

Section VI. Optional Detail — Please provide at least one of the following:

- ROI — Please provide a quantitative analysis of the hard and soft ROI factors expected and realized, to include breakeven analysis, IRR or NPV determination of hard factors and testimonial evidence from users or customers as to the realization of soft benefits.

- Improvement in Quality and Customer Service — Please provide quantitative evidence of improvements in product quality, production feedback and analysis, and quality control as well as data and/or testimonials providing evidence of improved customer service, which may include improved delivery times, fewer errors in production or communications, better customer communications and production reporting and so forth.

- Innovation — Please provide a description of the innovative aspect of the process and an argument for why this is unique and new, with a comparison to traditional alternatives and a description of the primary benefit the innovative aspect of the new process.

The integrated workflow completed in 2008 enables the president to issue work instructions directly even when he is not on the production floor, thereby achieving dramatic work efficiency. Before the integrated workflow was introduced, it took a total of 120 minutes to do one printing job (create 25 minutes, pre-press 45 minutes, press 50 minutes). After introduction of the integrated workflow, the total time required was reduced to 70 minutes (create 10 minutes, pre-press 25 minutes, press 35 minutes), a reduction of approximately 40%.
In addition, all business can be performed remotely from the Production Division. A flat organization with the president at the top has been realized giving rise to the following merits.

- Preparations can be performed in the office away from the printing machines
- Printing machines are for printing and profit can be gained by saving preparation time and performing the preparations for the job from the office
- Profit can only be gained when the printing machines are working, so the machines are not stopped
- Start and finish time of each job is controlled
- Job sharing (load balance can be controlled) can be realized on multiple printing machines
By centralizing business management, we were able to create a simple, flat organization with efficiently distributed personnel. As a result, the following were realized.

- Merit-based salary system
- Traceability
- Transparency

**Motivation enhanced by flat organization**

- Operator cannot blame the machine
  - Creates an environment in which the employees compete to work better and faster
- "Baring" meetings are held every Monday
  - Due to work transparency, friendly competition promotes improvement by talking about successes and failures
- Awareness of issues can be shared through using the same printing machines and suffering the same problems
  - In the past, employees learned by watching senior colleagues and stole their skills
➢ Now they gain competency by having every detail drilled into them

➢ It is important for young people for everything to be digitalized
  ➢ Learn by numbers
  ➢ Roland’s CCI color control system is numerically controlled

No time is wasted, and time that used to be spent working is now dedicated to brainwork, enabling value-added products to be designed without any increase in the workforce. In future, we will build a JDF-integrated workflow with an even higher degree of perfection to achieve the end goals listed below.

• Stable quality requiring no skill
• Streamlining, cost reduction, quick delivery
• Quality assurance
• Reliable information management
• High efficiency, self process certification
• Total automation