

## **Second Place Winner**

### **2007 Jürgen Schönhut Memorial CIPPI Award**

Best cost/benefit realization as a result of process automation  
implementation

## **Yamazen Communications Co., Ltd.**



### **Detailed Application Information**

#### **1. Background**

Before starting our story, let us tell you why we named our company 「山善」 (Yamazen). In Japanese, (Yama) generally means “mountain” but it has some other meanings such like “so many”. And (Zen) generally means “goodwill”.

Since we established our company at 1957 i.e. 57 years ago, we keep in mind our company should be filled with service hearts of goodwill for both customers and employees and should stand like a mountain in the printing arena. In 2000, we changed our company name to Yamazen Communications co., ltd. to scale up our business to the area communications via internet. We have got ISO9001, 2000 in 2002.

Now, we have 86 employees and the annual sales of 2006 reached to 1.2 billion yen (7.28 million euro/1 euro = 165 yen). Head office, printing factory and the office of “Tochi-Navi” portal site are located in Utsunomiya, Tochigi prefecture. There is a Tokyo branch too.

We have established our business in the following sectors ...

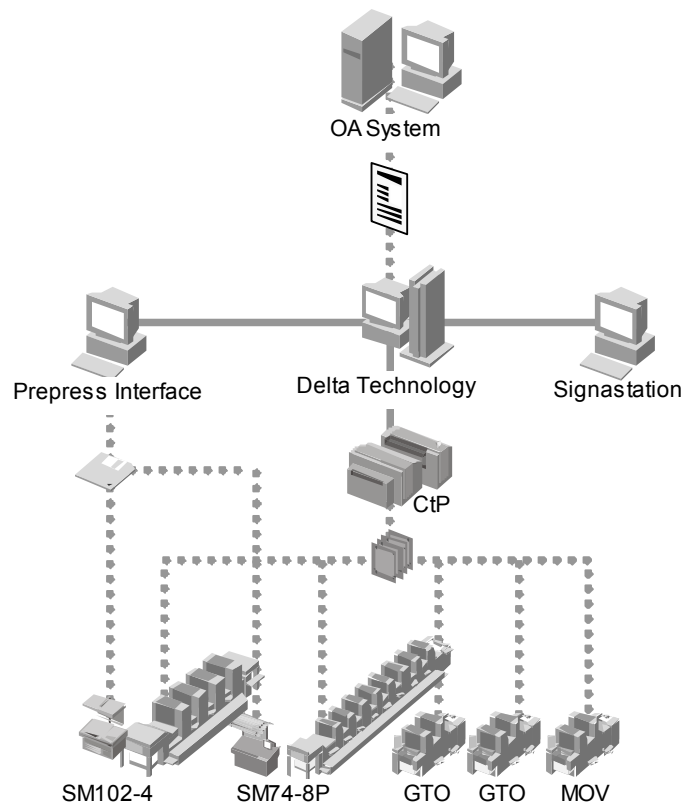
- Conventional printing for commercial area, such as advertising printing, POP, book printing, photo albums etc.
- Newly made and managed unique web portal site “Tochi-navi” as well as franchise business.
- Support service to make custom web portal site for other companies.

We have been working to provide high quality printing goods to the customer for over half a century. And six years ago, we started the web portal “Tochi-navi (<http://www.tochinavi.net/>)” aiming at creating new communication area to bridge between advertising provider and the end user. Fortunately, we could get excellent responses from the market and “Tochi-navi” had grown to become the leading portal site in the local Tochigi area. As the interface between information provider and the end user, we should keep our position and work up our own communication muscle.

#### **Workflow Environment and Conditions Prior To Implementation**

We introduced Heidelberg RIP and CtP in July 2000 and totally switched our production to CtP based. And at that time, we already installed various Heidelberg printing machines such as SM 74-8P, SM 102-4, 2 GTOs , MOV to respond all kinds of printing needs like name cards, leaflets, booklets, brochures, forms, pamphlet, posters, catalogs etc.

Accompanied by the introduction of CtP system, we also implemented the PrePressInterface (Heidelberg) to handle the PPF data in digital form by using memory cards.



(Figure1: Workflow before 2005)

## 2. Objectives

As explained above, we had introduced many kinds of printing machines to respond to various customer needs. This production environment had two faces – advantage and disadvantage – we could answer to the customer needs rather flexibly but increasing complexity in the job site could disturb the effective production. And at the same reason, it was difficult to get exact cost/price information of each job.

Then we set the goal to simplify the complex production process and tried to reduce total production time and costs without operator's intervention by the following measures.

### a. Cutting the outsourcing costs by digitalization

With the introduction of PDF workflow in 2005, we changed the way to provide the data to outsourcing offset web companies from film to TIFF binary data, and could cut the film output costs.

### b. Specializing on color printing in the house

We tried to focus on color jobs in the house and gave other print jobs to outside printers to eliminate complex production management labor costs.

### c. Introducing MIS

To get effective retrieval performance and other job information, we intended to introduce domestic Management Information System to get various data to eliminate overlapping jobs during production control steps.

### d. Job tracking and needs of more accurate data

To get an accurate machine working data, each operator had to make a detailed production report every day but this took a lot of the operator's time in addition to his daily job. In addition, these collected data were not only inaccurate

but also useless for management because of manual input.

As it is important for us to collect more accurate data for corporate management, we aimed to get more accurate daily report with less additional labor.

### **Goals for automated workflow implementation**

- Getting accurate and detailed job tracking data with less operator intervention.
- Reducing the cost of outsourcing especially with films for web printing. Target: 0%.
- Reducing the time for production control. Target: 30 % decrease of indirect work.
- Reducing the make ready time for printing and keeping high quality printing.
- Reducing time and labor in prepress.

### **3. Methodology**

#### **Competitors and products under discussion (CtP, PDF workflow RIP, MIS)**

We went through the following companies and products one by one from the point of view of process improvement including JDF workflow.

- Heidelberg PDF workflow RIP and CtP
- Screen PDF workflow RIP and CtP
- Kodak (Creo) PDF workflow RIP and CtP
- Tosbac Systems MIS
- Olive MIS

#### **Prerequisites of the system to be implemented ...**

1. Native JDF based system and JDF expansibility in future.
2. High level of automation and integration of job management and color management workflow.
3. Easy handling capability of existing data (Deltalist).
4. Growth potential of the system for future enhancement based on the current platform.
5. Running parallel with the cost reduction including partial automation and the total economization of the whole process with indirect labor.
6. Totally integrated system from top to bottom (prepress to printing) with high quality color management.
7. JDF connectivity to MIS.
8. MIS system can answer easily to special customer needs.

Considering these important points in every aspect, we decided to implement Heidelberg Prinect Printready System and Prinect Meta Dimension (PDF workflow RIP), Prinect Signa Station (imposition software), and Tosbac Hidariuchiwa (MIS). Only Heidelberg could satisfy all of our demands to establish a cost-effective and integrated workflow.

### **4. Implementation story and important improvements**

#### *Project Phase 1: April – December 2005*

Introducing MIS, cleaning up of master data, setting up operational environment of job information input and activating the system.

*Improvement:* Switching over master data from legacy system to new MIS was over, start of running test.

#### *Project Phase 2: October – November 2005*

1. Switching from current workflow to new workflow.
2. Adjusting the output curve of CtP plate.
3. Working on operator training.

*Improvement:* By activating the pre-flight check function of Printready and Prinect Signa, we could get the exact data before output and save a lot of time and labor cost. With our original system, we had no possibility to check the CtP plate after their output.

*Project Phase 3: November –December 2005*

Start production control on the MIS and send Job ticket to Printready and CP2000.

*Improvement:* Re-maintaining MIS master data and start production process management on the MIS. Start to send Job ticket to the Printready/CP2000 and get a job tracking data.

*Project Phase 4: October – November 2006*

1. Start Print Color Management (PCM) and set the standard parameters for in-house printing.
2. Start RGB workflow and Wide Color (printing method for 4 color process with wider color space than conventional printing)

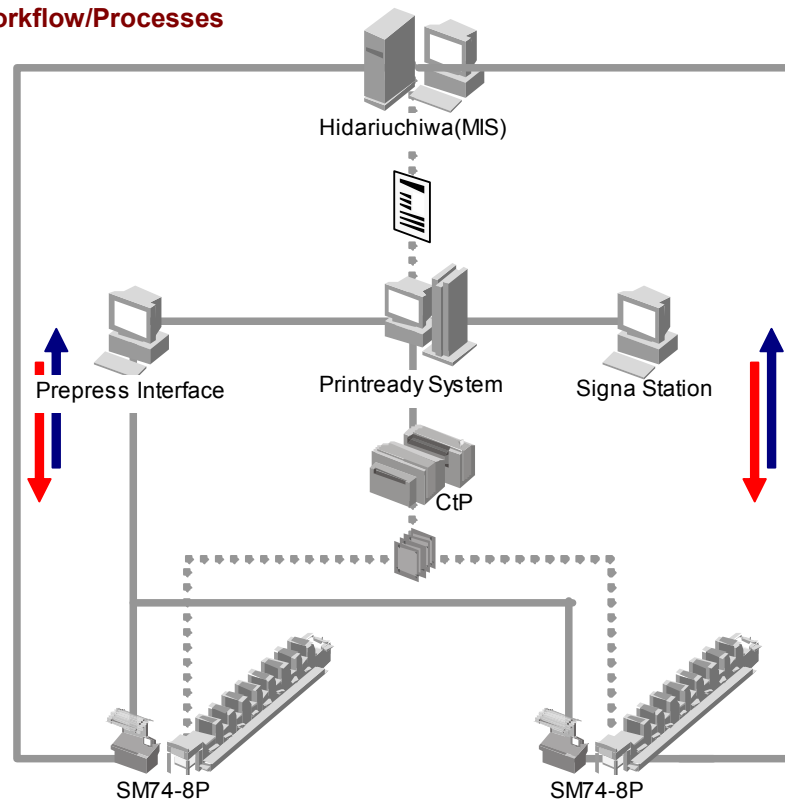
*Improvement:* Successful implementation of RGB workflow and Wide Color let us lead the new position to the customers and the end users.

*Project Phase 5: April 2007 to September 2010 (in progress)*

1. Integration of all production process based on JDF.
2. Automation of CtP workflow.
3. Completely integrated production management.
4. Color Solution (cycle color management process between press and postpress )

*Improvement:* Moving in the direction of realization. The first step is as good as half over!

**5. Resulting Workflow/Processes**

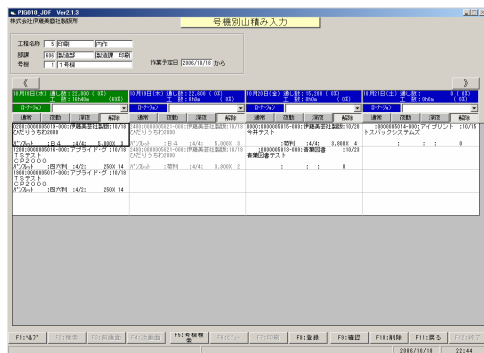


(Figure2: Integrated workflow in 2005)

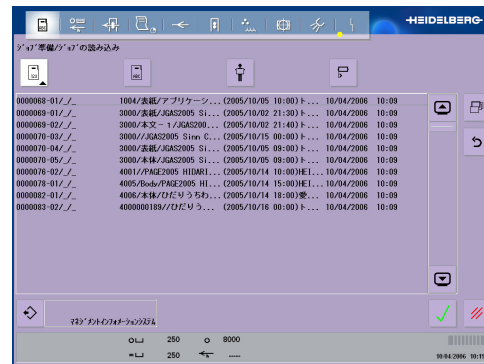
- With the new PDF/JDF based workflow, our operational efficiency reached a level we have never seen before. In our original system, result of ripping can be seen only on the Delta Technology, but on the Printready all results can be seen everywhere and this help us to get into new steps. As for the data control, the Printready

allows easier management for each job, for example, searching previous job etc.

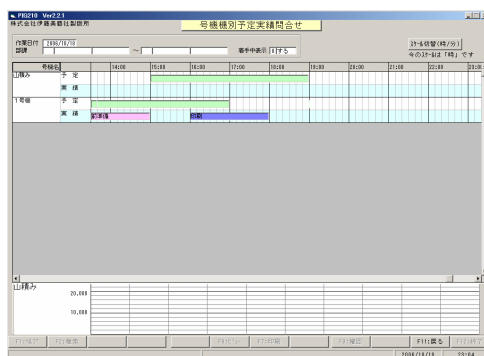
- Before new system implementation, it is necessary to prepare for the Deltalist which should be created thinking about its direction and sometimes re-calculation must be done in case of mistakes. But after implementation, Printready and SignaStation is integrated and therefore they can easily create PDF pages with no care about imposition. As a result, this let us save amazing costs for mistakes.
- Thanks to MetaDimension calibration manager which allows us to adjust dot gain for plate/paper and ink, many troubles in printing are easily solved..
- On the MIS, we realized that to make a schedule for each printing machine was no longer messy work by referring real working situation in the workplace. To-and-fro motion between office and workplace was dramatically reduced. In addition, even operators can easily make a detailed production report automatically without writing report by hand, which helps them to focus on their jobs and raise up their performance.



*(This screen is a schedule for each printing machine by Hidariuchiwa.)*



*(Prinect CP2000 Center can pick up jobs from Hidariuchiwa)*



*(This screen showing in real time printing machine status and*

*SFDC)*

## **6. Best cost/benefit realization as a result of process automation implementation**

### **6-1. Reduction of cost for order to outside printers**

After we introduced Heidelberg CtP system, as mentioned before, we became a provider of PDF instead of films. Then total film cost to be given to outside printers were completely eliminated. **If we assume the time/cost rate is 100 yen per minute**, we will get the following result.

*Saving result:* 6,000,000 yen (37,000 euro) per year

### **6-2. Reduction of makeready time, waste sheets, and making reports**

#### a. Reduction of makeready time

Online Job ticket from MIS and real time process control resulted in 7 min. reduction in job setting and presetting on the printing machine. (10 min. in 2006 to 3 min. in 2007)

$7 \text{ min.} \times 4,000 \text{ jobs} = 28,000 \text{ min.} \times 100 \text{ yen} = 2,800,000 \text{ yen} \times 2 \text{ machines} = 5,600,000 \text{ yen per year.}$

*Saving result:* 5,600,000 yen (35,000 euro) per year

#### b. Reduction of waste sheets

By the successful Print Color Management, 100 sheets less waste per job (275 to 175 sheets). (Average cost will be assumed 6 yen per sheet.)

$100 \text{ sheets} \times 4,000 \text{ jobs} = 400,000 \text{ sheets} \times 6 \text{ yen} = 2,400,000 \text{ yen per a year}$

*Saving result:* 2,400,000 yen (15,000 euro) per year

#### c. Reduction of time for production reports on the printing machine.

Comparing 2005 and 2006, 4 min. time reduction achieved (from 5 to 1 min.) for production reports per job.

$4 \text{ min.} \times 4,000 \text{ jobs} = 16,000 \text{ min.} \times 100 \text{ yen} = 1,600,000 \text{ yen} \times 2 \text{ machines} = 3,200,000 \text{ yen per year}$

*Saving result:* 3,200,000 yen (20,000 euro) per year

### **6-3. Reduction of time for delivery date management and job tracking**

a. JDF based real time management of all printing machines lead us to save 160 min. (that is from 180 min. in 2005 to 20 min. in 2006) of the time needed to control delivery date processing.

$160 \text{ min.} \times 285 \text{ days} = 45,600 \text{ min.} \times 100 \text{ yen} = 4,560,000 \text{ yen per year.}$

*Saving result:* 4,560,000 yen (28,500 euro) per year

#### b. Reduction of time for job tracking

We could achieve 60 min. per day for job tracking (120 min. in 2005 to 60 min. in 2006)

$60 \text{ min.} \times 285 \text{ days} = 17,100 \text{ min} \times 100 \text{ yen} = 1,710,000 \text{ yen per year.}$

*Saving result:* 1,710,000 yen (10,688 euro) per year

### **6-4. Time & cost saving effect by process automation and other factors**

a. By applying automatic preflight function, we could get 10 minutes reduction per job for processing (15 min. in 2006 to 5 min. in 2007).

$10 \text{ min.} \times 6,000 \text{ job} \times 100 \text{ yen} = 6,000,000 \text{ yen per year}$

*Saving result:* 6,000,000 yen (37,500 euro) per year

#### b. Time & cost saving effect for eliminating wrong imposition

With the new PDF workflow, the operational loss of making flat or imposition is dramatically reduced.

In 2005, 10 percent of 4,500 jobs needed to be worked over.

$10 \text{ min.} \times 4,500 \times 10\% = 4,500 \text{ min} \times 100 \text{ yen} = 450,000 \text{ yen per year.}$

In 2006, 2 percent of 6,000 jobs needed to be worked over.

10 min. x 6,000 x 2% = 1,200 min. x 100 yen = 120,000 yen per year.

*Saving result:* 330,000 yen (2,063 euro) per year

**c. Reduction of time for handling printing troubles**

Thanks to MetaDimension calibration manager which allows us to adjust dot gain of plate and/or paper and ink, so many factors of printing troubles are solved.

In 2005, 10 percent of 3,200 jobs had some troubles.

20 min x 3,200 x 10% = 6,400 min. x 100 yen = 640,000 yen per year.

In 2006, the numbers of jobs were increased to 4,000 but printing troubles were decreased to 5 percent of them.

20 min x 4,000 x 5% = 4,000 min. x 100 yen = 400,000 yen per year

*Saving result:* 240,000 yen (1,500 euro) per year

**6-5. Growing effect of in-house printing**

We were able to expand our production performance through real time job tracking of printing machines and process management optimization. This enabled us to achieve 80% of the increased sales amount of 100,000,000 yen, that is 80,000,000 yen in house.

*Saving result:* 80,000,000 yen (500,000euro) per year

**7. ROI Calculation and Conclusion (JPY base)**

		Periods				
		2005	2006	2007	2008	2009
Discount rate	3%					
1 Discount factor		#DIV/0!	0.9426	0.9151	0.8885	0.8626
<b>Benefits (in savings)</b>						
6-1	Reduction of cost for outside order	0	6,000,000	6,000,000	6,000,000	6,000,000
6-2	Reduction of makeready time and waste paper	0	11,200,000	11,200,000	11,200,000	11,200,000
6-3	Make efficient in production control	0	6,270,000	6,270,000	6,270,000	6,270,000
6-4	Reduction by process sutomation	0	6,570,000	6,570,000	6,570,000	6,570,000
6-5	Increased inner process	0	80,000,000	80,000,000	80,000,000	80,000,000
<b>2</b>	<b>Total annual savings</b>	0	110,040,000	110,040,000	110,040,000	110,040,000
	Cumulative savings	0	110,040,000	220,080,000	330,120,000	440,160,000
<b>3</b>	<b>Discounted annual savings</b>	0	103,723,254	100,702,188	97,769,115	94,921,471
<b>Total investment</b>						
<b>External invensment (Products)</b>						
	Prinect Printready, Prinect Meta Dimensio	10,000,000				
	Prinect Signa Station	1,500,000				
	Hidariuchiwa (MIS)	10,000,000				
<b>Internal investment (test and internal training)</b>						
	Time quality manager	200,000				
	Internal training	300,000				
	Materials (Paper,Ink,etc.)	200,000				
<b>Maintenance cost (recurring)</b>						
	Internal maintenance of standardization	500,000	500,000	500,000	500,000	500,000
	Update cost	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
<b>4</b>	<b>Total annual costs</b>	22,200,000	1,500,000	1,500,000	1,500,000	1,500,000
	Cumulative costs	22,200,000	23,700,000	25,200,000	26,700,000	29,700,000
<b>5</b>	<b>Discounted costs</b>	22,200,000	1,456,311	1,413,894	1,372,712	1,332,731
<b>6</b>	<b>Net benefit (annually) (=2-5)</b>	-22,200,000	-1,456,311	108,626,106	108,667,288	108,707,269
	Cumulative net benefit	-22,200,000	-23,656,311	84,969,795	193,637,083	302,344,352
	Discounted net benefit	-22,200,000	-1,456,311	102,309,360	99,329,476	96,436,384
<b>7</b>	<b>Discounted net benefit (=3-5)</b>	-22,200,000	-1,456,311	102,309,360	99,329,476	96,436,384
	<b>NPV (Net present value in JPY)</b>	368,046,467				
	<b>ROI (Return on investment) %</b>	1584.16%				

**7. ROI Calculation and Conclusion (EURO base)**

		Periods				
		2005	2006	2007	2008	2009
Discount rate	3%					
<b>1</b>	Discount factor	#DIV/0!	0.9426	0.9151	0.8885	0.8626
<b>Benefits (in savings)</b>						
6-1	Reduction of cost for outside order	0.00	37,500.00	37,500.00	37,500.00	37,500.00
6-2	Reduction of makeready time and waste paper	0.00	70,000.00	70,000.00	70,000.00	70,000.00
6-3	Make efficient in production control	0.00	39,187.50	39,187.50	39,187.50	39,187.50
6-4	Reduction by process automation		41,062.50	41,062.50	41,062.50	41,062.50
6-5	Increased inner process	0.00	500,000.00	500,000.00	500,000.00	500,000.00
<b>2</b>	<b>Total annual savings</b>	0.00	687,750.00	687,750.00	687,750.00	687,750.00
	Cumulative savings	0.00	687,750.00	1,375,500.00	2,063,250.00	2,751,000.00
<b>3</b>	Discounted annual savings	0.00	648,270.34	629,388.68	611,056.97	593,259.19
<b>Total investment</b>						
<b>External investments (Products)</b>						
	Prinect Printready, Prinect Meta Dimensio	62,500.00				
	Prinect Signa Station	9,375.00				
	Hidariuchiwa (MIS)	62,500.00				
<b>Internal investment (test and internal training)</b>						
	Time quality manager	1,250.00				
	Internal training	1,875.00				
	Materials (Paper, Ink, etc.)	1,250.00				
<b>Maintenance cost (recurring)</b>						
	Internal maintenance of standardization		3,125.00	3,125.00	3,125.00	3,125.00
	Update cost		6,250.00	6,250.00	6,250.00	6,250.00
<b>4</b>	<b>Total annual costs</b>	138,750.00	9,375.00	9,375.00	9,375.00	9,375.00
	Cumulative costs	138,750.00	148,125.00	157,500.00	166,875.00	185,625.00
<b>5</b>	Discounted costs	138,750.00	9,101.94	8,836.84	8,579.45	8,086.96
<b>6</b>	<b>Net benefit (annually) (=2-5)</b>	(138,750.00)	(9,101.94)	678,913.16	679,170.55	679,663.04
	Cumulative net benefit	(138,750.00)	(147,851.94)	531,061.22	1,210,231.77	1,889,652.20
	Discounted net benefit	(138,750.00)	(9,101.94)	639,433.50	620,809.22	585,172.23
<b>7</b>	Discounted net benefit (=3-5)	(138,750.00)	(9,101.94)	639,433.50	620,809.22	585,172.23
<b>NPV (Net present value in €)</b>		2,300,290.42				
<b>ROI (Return on investment) %</b>		1584.16%				

**Return on investment and future target**

As stated above, we are very proud of our decision to introduce Heidelberg Prinect Printready System to solve our various problems and to establish a cost-effective automated workflow.

Both reduced indirect work and increased efficiency by process automation could raise the in-house production capability. As a result, 80% increase of sales was processed in-house and that was major contribution factor of sales profit. In *Project Phase 5*, we are willing to enhance process automation for all production steps through prepress to Postpress by JDF and get more profits. It will not be easy, but we believe it is worth to do.