Print Automation Case Study:
Modern Litho-Print Co.

6009 Stertzer Road
Jefferson City, MO 65101
www.ModernLitho.com

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Executive Summary

Modern Litho-Print Co., a certified woman-owned business located in Jefferson City, Missouri, has been in business for 73 years. Modern Litho, along with its sister company, Brown Printing, Inc., are wholly-owned subsidiaries of Covenant Graphics, Inc. (CGI), a holding company. CGI had 2009 revenues of $14.7 million. The company, whose President is Darrell Moore, has about 118 employees, including 14 sales professionals located around the country. Modern Litho specializes in the manufacture of publications and association-related printing. July 2010 marks the company’s one-year anniversary of utilizing a digital job ticket.

Modern Litho is the only company in North America that is running the entire EFI Monarch MIS Suite, integrated with Kodak Prinergy/InSite. This configuration has enabled the company to implement a level of automation as close to “lights out” as a publication printer could possibly be, and resulted in room to grow the company by 25% without adding additional people or technology resources. The following hardware and software are integrated into this seamless digital workflow:

- EFI PrinterSite Internal, V 10.0.0.0
- EFI Monarch Foundation (formerly Hagen OA), V 2010.1.1.1
- EFI Monarch Planner, V 2010.1.2.94
- Kodak InSite Prepress Portal, V 6.1.0.7475
- Kodak InSite Storefront, V 3.1.2.2776
- Kodak Prinergy, V 5.1.2.2
- Kodak Rules Based Automation
- Kodak Virtual Matchprint, V 6.0.1
- EFI PrintFlow, V 2010.1.23.4
- EFI Auto-Count, V 2010.1.3.2
- EFI Plant Manager, V 2010.1.3.2
- Microsoft Excel 2007
- SmartLinc Smartware09, V 1.0.0.0
- CCH Sales Tax Service
- Heidelberg Prinect Prepress Interface V 3.3
- Kodak Magnus Platesetter
- XL 105 Heidelberg 5 color with Aqueous and roll to sheet capabilities
- Heidelberg 102 - 6 color
- 2 Heidelberg 102 - 4 color
- Heidelberg SM 52 - 5 color
- Heidelberg 450 Stitcher – 6 pocket with two cover feeders
- Mueller Martini Bravo T Stitcher – 8 pocket with Cover feeder
- Mueller Martini Acoro Perfect Binder with PUR glue option – 20 pocket
- Heidelberg Stahl Folder RFH 82
- MBO B26 Buckle Folder
- MBO R 820 Knife Folder
- MBO B26 Folder
- Cordoba Score/Perf Machine
- Buhrs 3000 Polybagger
- 2 VideoJet Ink Jet Systems with 2 Cheshire Tabbing units

Two years ago, Modern Litho was running its business on a paper job ticket. Requests for estimates received via Sales or direct from the customer were often incomplete, requiring multiple contacts to gain sufficient information in order to generate an estimate, resulting in two or three days on average before a quote could be provided to the customer. Since many customers act on the first quote(s) they receive, this lead time likely cost the company business, although at the
time, systems were not in place to accurately track win/loss rates and reasons for losing. Alternatively, a quote would be generated based on incomplete information, including page counts which often cannot be finalized until the file is submitted and processed. Although the estimate, and the order when received, were entered into Hagen, there was still a paper job ticket wending its way through the plant and many conversations taking place among sales, CSRs and production to shepherd the job through the plant. Perhaps the most glaring example of the inefficiency in the previous process is the fact that the then-Plant Superintendent was spending two to four hours per day manually writing the production schedule for five presses, and the Bindery Foreman spent one to two hours per day creating a written bindery schedule for the third shift.

With the new automated process in place, the entire workflow is much more streamlined. Printer-Site Internal, using custom order forms, will not allow Sales to submit a request for estimate unless all required information is present. Estimates are turned around in no more than two days, and many times, same day, based on customer requirements. Once the quote is accepted by the customer and files are uploaded, processing files, creating the job ticket, proofing, imposition, planning and scheduling are all compressed into a series of parallel actions, many of which are automated. Proofs are delivered within 10 minutes of file upload, and the entire color calibrated remote monitor proofing process can be concluded within hours rather than four to five days minimum with hardcopy proofs in the past. This means the job can be ready to go to press within a few hours of the quote being accepted. In the vast majority of cases, press checks are no longer required.

This has caused a domino effect throughout the entire plant, making jobs run through smoothly from that point, almost always without a hitch. Modern Litho has experienced a minimum of two days reduction in turnaround time and some automated jobs are running through the plant in one to two days without problems. Nearly 2,500 hours annually are being saved in the press room, 165 hours saved on invoicing, and more accurate invoices are now being delivered three to five days faster. Press re-runs and bindery shortages are virtually a thing of the past.

From a business perspective, Modern Litho now has all business and production information available in real time for better business management and capacity to grow 25% without adding more resources.

This has been a revolutionary transformation for Modern Litho in a very short timeframe. The company marks the starting point at the implementation of the electronic job ticket in July of 2009, with the final pieces of the puzzle being put in place during August of 2010. Not only is the business on a more solid and productive footing from the perspective of internal operations, but it is much better positioned to serve customers, both acquiring new customers and retaining existing ones. While there are no definitive customer satisfaction metrics in place, there are virtually no more customer complaints being received, which speaks volumes for the response from customers to this new automated process.

Section I. Background — Before its new highly automated JDF-based workflow was put in place, Modern Litho was like many other printing companies. Everything was based on a paper job ticket that followed the job through the plant. And the many manual steps in the production process meant that job tickets, jobs and people were constantly moving backwards in the process to correct errors, collect missing information and more. The diagram below reflects the workflow as it existed in the past. A full description follows.
Estimates and Quotes
This manual process began with a sales rep completing a handwritten preorder sheet based on what he was able to learn from the customer about the proposed job. This information is often incomplete or incorrect. This means that once the estimator begins working the estimate, she must call the customer or the sales rep to obtain the required information, causing delays. In addition, handwritten preorder sheets can be difficult to read and result in miscommunications on job specifications. Average turnaround time for an estimate, historically, was 2-3 days. Customers were beginning to complain, and it is not clear how many jobs we lost due to delays in delivering estimates.

Once the estimate is complete, the sales rep discusses the quote with the customer, notifying the CSR when the customer accepts the quote.

Creating a Job in the System
Once the quote is accepted, the CSR enters information into Hagen (now Monarch) based on available information. Quotes sometimes must be reissued as more data becomes available. The CSR creates a handwritten job ticket (See Appendix B for image). This job ticket’s first stop is Desktop, awaiting customer files.
File Handling
When customer files are ready, the customer uploads them into Kodak InSite, triggering notification to Desktop that files are ready to be processed. Desktop must examine files and work with the CSR on differences between the files and the quote; this most often involves discrepancies in page counts. At this stage, the handwritten job ticket is often revised, and sometimes quotes need to be reissued to reflect the actual job specifications. Desktop creates the job in Prinergy, dropping in prepared files and sends the paper job ticket to Prepress.

Prepress uses Preps in Prinergy to create impositions and adjust files as necessary. Paper requirements are calculated manually, and paper is either manually ordered or reserved in in-house stock. Forms and runs for presses, including impositions, are listed on the back of the job ticket.

Proofing
Prepress creates proofs in hardcopy or posts to InSite, depending on customer requirements. Hardcopy proofs are overnighted to the customer, causing a day delay and the costs associated with shipping. The customer reviews the proof, sometimes with multiple iterations. From generation to approval, the proofing process can take 4 to 5 days or more, and again incurs the time and cost of overnight shipping the proof back.

Prepress makes changes requested by customer in Prinergy, manually removing old pages and inserting new ones. This can be an error-prone process. If more than 50% of the pages are changed, another proof goes back to the customer, repeating the cycle. Sometimes AA’s are not captured for invoicing purposes.

Plating
When proofs are approved by the customer, Prepress sends the job to the Trendsetter for plating, manually loading and unloading plates. The Prepress operator places plates in a rack with handwritten labels reflecting the job number and other relevant information. The job ticket then goes to the Plant Superintendent for scheduling.

Scheduling
The Plant Superintendent builds a daily press list by hand (see example in Appendix C) for all five presses. This process was started by his predecessor and became increasingly onerous, taking two to four hours per day of his time. A copy of the press list is provided to each press operator along with paper job tickets, and to the warehouse for paper staging. On weekends, it can be difficult for press operators to know what is ready to run.

The bindery manager also handwrites a daily schedule for bindery, consuming one to two hours of his time.

Production
With the schedule and job ticket in hand, the press operator retrieves the plates from the rack, comparing the job number on the job ticket and the plates, inspects the plates and loads on press. The press operator initially sets ink keys by hand and eye, starting the run on best guess, and continues to waste paper until color quality is met. It is a manual process to determine and track makeready waste.
Load tags are manually written for each form as it comes off of the press, including job number, count (which may or may not be accurate), and form number. These are placed on the skid for each form. The job ticket moves to Bindery upon completion of the press run.

**Bindery**

Bindery looks at the handwritten schedule and searches for the job ticket to sort out the number of forms listed on the back. Reads load tickets to match up to job ticket. Shortages may require re-runs in quantities as low as 200 sheets if counts are off. Job ticket moves to shipping/mailing.

**Distribution**

Bound product is transferred to mailing, or shipping by UPS or a freight line. Shipping manually fills out the UPS form online, writes the tracking number on the job ticket. Job ticket is sent to accounting.

**Invoicing**

Accounting checks all steps to make sure everything is invoiced, including extra proofs, AAs and shipping. If UPS tracking number is not available or cannot be read, this requires additional research. Sales tax is calculated manually.

**Financial Performance**

Inadequate systems are in place to easily track actual versus estimate, job or customer profitability and other financial metrics required to run the business.

**Section II. Objectives** — The company had made significant capital investments in presses, bindery and mailing equipment, in excess of $12 million in the last ten years. Management’s emphasis for 2009 was to improve and streamline processes and procedures to take full advantage of those investments.

With the impending retirement of the Plant Superintendent, the Assistant Plant Superintendent (now Director of Operations) knew that there had to be a better way to manage the business. He was not anxious to spend two to four hours per day manually scheduling, and believed that the technology was available to dramatically change the company’s workflow for the better. In the summer of 2008, he attended EFI Connect, EFI’s user group, to explore what could be done, building on the company’s existing Hagen MIS system and Kodak’s Prinergy and InSite. He was delighted with what he learned at Connect, including the ability to speak with representatives of both EFI and Kodak at the same event, and began to put the transformation process into play. At the time, it was sufficient to understand the opportunity for improving workflow through process automation. The company had no real basis for projecting the outcome based on lack of data and the manual nature of the existing workflow. Nonetheless, there was a vision and a commitment to improving productivity and workflow, and a belief that the business would benefit from these investments. This leap of faith generated results far beyond expectations.

**Section III. Methodology** — The core solutions for Modern Litho’s workflow automation initiative were already in place prior to beginning this project, but were not connected. Those were EFI’s Hagen OA (now Monarch Foundation) and Kodak’s Prinergy and InSite. In our discussions with these two suppliers, we believed we could not only get the support and cooperation we needed to integrate this multivendor workflow, but that both companies had the requisite capabilities to make it happen. As a result of that decision, and all of the hard work by all parties, we believe Modern Litho is the first company in the United States that is running the entire Monarch Suite integrated with Prinergy/InSite and benefiting from bi-directional JDF/JMF connectivity. This is the workflow “Holy Grail” that everyone has been pursuing since JDF was first brought to
the market and its promise was understood. EFI’s integration with SmartLinc for automation of shipping documents is also in place. Integration between Monarch Foundation/Planner and Xpedx for automated ordering of paper is in the development process with EFI and Xpedx. Both are critical elements of this story.

Once we had commitments from our existing vendor partners and understood the full range of available capabilities, we did not feel the need to pursue other solutions. The results we have achieved validated our decision process.

**Section IV. Implementation Story** — This implementation was quite rapid and involved virtually everyone in the plant, as well as assistance from EFI, Kodak and Heidelberg. It was a true team effort. Although as one might expect, there were challenges along the way, they were easily overcome through this team effort. The timeline below reflects the amazingly brief amount of elapsed time from start to finish. Key milestones are reflected on this timeline.

The first three to six months of implementation involved a complete review of every work center and operation for every machine in production. We analyzed speeds, waste and paper inventory before entering that data into the Hagen system. Many hours of setup were required to make sure the model fit reality; i.e., was the time and paper waste for each production process realistic. We also worked through many bugs and fixes with EFI support on a daily and weekly basis to assure bi-directional communication was working and each task was accounted for.

PrintFlow Scheduling also was set up and tested, with every machine appearing on PrintFlow’s Gantt chart with jobs scheduling from Planning and sending data into Hagen.

Upon completion of testing, we moved into a live environment which also uncovered more issues with connectivity and workflow that needed to be tweaked for the following month. With the completion of the work on the Planning and Scheduling modules, we then proceeded to enter into a beta with Kodak and EFI to bring Planner and Prinergy connectivity to the workflow. This required several weeks of setup and hundreds of hours of testing and feedback to both EFI and Kodak to integrate the most robust Prinergy prepress system into the first truly complete Planning
module. Monarch Suite was rolled out and EFI sent three support people into our facility to ensure a smooth upgrade, with our live environment being the first company to have Monarch Suite running with the prepress interface.

One year into our implementation, we purchased Auto-Count for all presses. Networking cable (Cat5e) had to be run since connectivity would be necessary for the workflow, and work began with EFI support to connect each press to the workflow to be monitored. As a result, each machine had a new workstation with Auto-Count running, and that meant adding an additional step in the automated workflow.

Once work got underway on the electronic job ticket, hours of planning/testing were required, as many pieces had to be tied into the ticket for live updates. Three months later, we purchased Auto-Count for the entire bindery as we recognized the huge impact it was making in the pressroom, and to complete the bi-directional workflow we finished networking as well.

Then purchase/installation/setup began on PrinterSite Internal. Three to four weeks of training and set up concluded with pre-defined templates for sales and that allowed us to begin training the sales team. We initially rolled PrinterSite Internal out to three of our 14 sales people so they could start using it and supply feedback to allow us to perfect the system. Three months later, three more sales professionals were added and many more training sessions completed as we felt that the PrinterSite Internal implementation cycle was complete and ready for all sales personnel.

New company servers and a more robust Prinergy server were added as we realized that the load was slowing down our existing servers. May 2010 brought yet another opportunity in the form of Plant Manager, which gave us the ability to monitor every machine from the managers’ and process owners’ desks. The ability we now have to extract data using Excel has completed what we know to be the first truly robust bi-directional system of this type in operation. It has opened our eyes to production data as we’ve never known it before and revolutionized the way we manage and operate our company.

**Section V. Resulting Workflow/Processes** — Because the innovation and level of change in our workflow was so dramatic, we chose to provide a full description of the previous workflow, including the “before” workflow diagram, in the background section above. Section V is devoted to the new workflow and the results/benefits we have achieved.

With the new system in place, including the installation of a Magnus platesetter with auto load and unload in August 2010 and the requirement on August 16th that all sales personnel submit requests for estimates using PrinterSite Internal, the workflow presents quite a different picture as the figure below reflects.
Estimates and Quotes
All sales personnel are required to use EFI PrinterSite Internal effective August 16, 2010. PrinterSite Internal is configured with templates based on bindery type that are prepopulated with the fields relevant to that specific type of project. Sales fills in the template from anywhere with an Internet connection, including the customer site. Requests cannot be submitted unless all required information is completed. Once sent, the request is automatically added to the estimator’s queue and can be prioritized if needed.

The estimator completes quotes in order of priority. The quote is pushed automatically to PrinterSite Internal, triggering an email to the sales rep or customer. The quote is automatically entered in Monarch Foundation. Sales rep presents quote to customer.

Results: Quotes are turned around in no more than 2 days, many times same day, a reduction from the two- to three-day average previously. Monarch Foundation is automatically populated with the quote information, eliminating the need to manually re-enter data. Customers have stopped complaining about quote turnaround time. Data is now readily available to determine our close ratio and begin to focus on improving that metric.

Creating Job in the System/File Handling/Proofing
Upon customer go-ahead, sales submits the job through PrinterSite Internal, automatically sending an email to the CSR with quote number. This web-based operation can be performed from any location. The CSR begins by starting the job in Planner, querying Monarch for a job number to create a Monarch job. About 70% of the job is automatically planned in Planner according to the quote and Planner does impositions automatically. The job is pushed to PrintFlow for automatic scheduling. The paper table has been imported into Planner for Monarch and an automated paper ordering process will soon be in place with Xpedx. The job ticket is electronic and available from any terminal in the plant.
Customer files are loaded to InSite. Since most of the work is publications, jobs from the previous issue are cloned and customers are trained to look for the correct upload folder based on that cloned job. Once uploaded, the job automatically enters the production stream. Files are automatically processed and an electronic proof is returned to the customer for approval within 10 minutes (customer notified by email). Planner will update while the job is proofing if there are discrepancies. The connectivity between Planner and Prinergy is being finalized as of this writing and when complete, Planner will do the impositions and push to Prinergy, eliminating the manual Preps step.

Modern Litho has made the investment with several customers (more to come), placing MatchPrint 6.1 at selected customer sites, guaranteeing that the digital proof is as good or better than the hardcopy proof. These are primarily being placed with customers whose work is color-critical and who might otherwise have required paper proofs and on-site press checks. Customer acceptance has been high, and this cuts several days off of the proofing process. This investment of about $1,500 per customer will pay big dividends.

During the online proofing process, the customer is able to reject pages, which are deleted automatically, and add new pages at no charge. Those changes can be proofed online, eliminating the need for additional proofs.

**Results:** These three steps are effectively consolidated into one automated process with the new workflow. Planner acquires a job ID from Monarch Foundation and about 70% of the job is automatically planned in Planner according to the quote. Planner does impositions automatically, leaving little manual process here. The fact that customers have proofs back in 10 minutes or less and (for those who have Kodak’s Matchprint 6.1 installed) can edit reliable, color-accurate proofs online using a local, calibrated monitor is revolutionary. If our systems detect that the remote monitor needs calibration, the remote operator is presented with a message and cannot proceed with proofing until calibration is complete. As a result, proofs are actually more accurate and aligned with our presses than previous hardcopy proofs, and bi-directional overnight shipping is eliminated. This robust solution supports 4,000 users on InSite and has proven to present little risk in using only electronic proofs.

This may be the single most important factor for Modern Litho in acquiring and retaining customers with a high level of customer satisfaction. It also eliminates charges for AAs if the customer is doing the mark-up online and streamlines our workflow with the elimination of many manual steps and opportunities for error. The addition of PrintFlow did not require new headcount since one headcount was moved from prepress to assume management of PrintFlow scheduling without the need to replace the prepress headcount, saving $50,000 in burdened salary annually.

The integration and automation of these processes has had a domino effect throughout the rest of the organization. Modern Litho is celebrating its first full year using an electronic job ticket, meaning all job data is instantly available from any computer terminal and the need to track down a hard copy job ticket is eliminated. The Plant Superintendent and Bindery Manager are no longer spending hours manually writing press/bindery schedules and in fact, one full managerial position was eliminated with the retirement of the Plant Superintendent and promotion of the Assistant Plant Superintendent to that position with no need to replace the Assistant Plant Superintendent, saving $100,000 in burdened salary annually.

In addition, Planner’s ability to automatically calculate waste in every step of the process has resulted in our ability to order the exact amount of paper required, using the integration between Monarch and Xpedx once it is in place, eliminating the need for manual creation of purchase orders.

Cloning the previous issue’s job to create a folder for the next issue that is ready for customer upload of files has also eliminated a significant amount of manual effort in creating the new issue’s job. Variances from issue to issue are generally relatively minor.
Job turnaround time has decreased by an average of five to six days per job when taking into consider- 
ation online proofing versus traditional hardcopy proofs. Every department has been impacted in a positive manner and is producing work in hours, if not days, faster. Modern Litho is producing some automated jobs, start to finish, in one to two days without a problem, compared to an average turnaround time of 10 days previously. The impact of these improvements cannot be overempha- 
sized in terms of competitive advantage, customer satisfaction and internal process improvement.

Plating
Once the proofs are approved, Prinergy sends the plates to the Magnus platesetter, annotating on the plates the job number, form number and customer name outside the image area, eliminating the need for manual labeling. Magnus automation enables unattended platemaking and one platemaker supports both plants. Press Scheduling is coded to reflect that plates are ready for pickup.

Results: Modern Litho’s unattended platemaking process means plates are generated as soon as the proof is approved, and ready for use on press. This eliminates a significant amount of wait time and confusion in the press room. Also, the ability to print information outside the image area means fewer opportunities for error in the press room.

Production
Planner automatically calculates waste at every step of the process, including bindery. As soon as the pressman loads the job, the ink density key settings are loaded at the press through integration between Prinergy and the Heidelberg Prinect Prepress Interface; the press cycles up, with 50% less time and waste in makeready. Auto-Count prints load tags automatically with the exact count, eliminating under-runs once the skid reaches bindery. Shortages only occur if there has been an equipment malfunction or spoilage due to employee errors and not because counts are off.

Results: Modern Litho estimates an average savings of about 200 sheets of makeready waste per form on 800 forms per month, resulting in a savings of more than 1.5 million sheets annually. We are also saving approximately 15 minutes per makeready on 800 makereadies per month, for an annual savings of nearly 2,500 labor hours, or a $100,000 annual press operator labor savings. Everyone in the plant has noticed how much more quickly jobs are moving through the plant. Addition of Kodak Ink Optimization (a Prinergy module) has resulted in a savings of 15-20% in ink utilization. Ink and paper savings annually is $138,000.

Bindery
Bindery can see when a job is ready on the job ticket or on the PrintFlow schedule and can pick up the job if it is not already in Bindery.

Results: Bindery has an accurate Auto-Count metric for the number of forms they receive, with bindery waste already calculated into the number. With load tags, counts, job ticket and schedule all electronic or computer printed, there is little room for error in interpreting contents. Bindery supervisor is no longer spending one to two hours per day scheduling.

Distribution/Invoicing
Bound product is transferred to mailing or shipping. UPS WorldShip is now tied into Monarch with SmartLine, automating creation of UPS shipping documentation and ensuring that the UPS tracking number is on the electronic job ticket for tracking and billing purposes. All information is now available for accurate invoicing in real time. CCH Sales Tax Service has been added to Monarch to eliminate the need to calculate sales tax manually.

Results: Modern Litho is saving an average of three minutes per invoice on 250 to 300 invoices per month, an average annual savings of 165 hours. In addition, time to invoice has been reduced by three to five days due to the ready availability of all information. As more data becomes available, an analysis will be performed to determine the impact on cash flow.
Financial Performance
All information required to run the business is now readily available in real time. Special reports can be exported to Excel for further analysis. Jobs run through the plant much more smoothly than in the past. Although 2009 sales volumes for CGI were down $1 million compared to the previous year, the increased efficiencies resulted in no reduction in taxable income.

Results: In addition to the two positions that have been eliminated, Modern Litho is positioned to grow at least an additional 25% as the economy and market demand returns, without any further investment in people or technology.

Software Workflow
The figure below reflects the various software elements of the new workflow and how they fit together. Everything is JDF enabled and communication among the various elements is seamless and bi-directional.
## Section VI. Optional Detail — ROI

<table>
<thead>
<tr>
<th>Process</th>
<th>Status After Automation</th>
<th>Process savings</th>
<th>Dollar savings</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimating/Quoting</td>
<td>Faster, more accurate quotes</td>
<td>Decreased from 2-3 days average to no more than 2 days, often same day</td>
<td></td>
<td>Reduced risk of losing jobs due to slow responses on quote</td>
</tr>
<tr>
<td>Job Creation through Proofing</td>
<td>Process almost entirely automated, including electronic job ticket, consolidating many manual steps. Proofs available in 10 minutes, approved in as little as an hour. Upon approval, automatic imposition.</td>
<td>This entire process has compressed from two to four days to one to two days, and one day in most cases. One managerial position eliminated</td>
<td>$100,000 estimated savings annually</td>
<td>Faster turnaround of proofs, consistent job planning process among CSRs</td>
</tr>
<tr>
<td>Plating</td>
<td>Now unattended</td>
<td>One prepress position eliminated</td>
<td>$50,000 estimated savings annually</td>
<td>Prepress operator move to scheduling to manage Print-Flow</td>
</tr>
<tr>
<td>Production</td>
<td>Reduced makeready by 50% in time and materials and eliminated one press operator position due to increased efficiencies in the press room</td>
<td>Savings of more than 1.5 million sheets of makeready waste annually; 15-20% ink savings, 15 minutes per make-ready for 2,500 hours annually</td>
<td>Ink and paper savings of $138,000 annually. Press operator labor savings of $100,000 annually</td>
<td></td>
</tr>
<tr>
<td>Bindery</td>
<td>Eliminated manual scheduling, better waste planning, virtually no shortages.</td>
<td>Less wait time, fewer errors</td>
<td>$10,000 estimated savings annually</td>
<td>Rarely going back to press for shortages</td>
</tr>
<tr>
<td>Distribution</td>
<td>All paperwork automated</td>
<td>Fewer errors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Invoicing

- All information available for immediate invoicing; automatic sales tax calculation
- Savings of 165 hours annually in invoicing, time to invoice reduced by 3-5 days
- $5,000 estimated savings annually
- Improved timeliness and accuracy of customer invoices

Financial Performance/Bottom Line

- All business and production data available for analysis in real time
- Turnaround time decreased by approx. 2 days per job. Every department working hours if not days faster.
- Ability to grow volume by 25% without adding additional people or technology. In addition, 30% of incremental sales growth will go directly to the bottom line, due to these efficiencies.

- Improvement in Quality and Customer Service — In addition to the process improvements described above, Modern Litho has just installed 20 cameras on its Acoro perfect binder that will read barcode information from prepress for signature recognition, as well as six cameras on our Heidelberg 450 Stitcher for image recognition. We are entering into beta testing with EFI and Mueller Martini for JDF connectivity for job setup definitions as soon as they are ready with the product.

The following customer testimonials demonstrate the terrific response we have had from customers to this automation project. Our customers have been very outspoken as to their appreciation for the work we have done and the way it has impacted their productivity, reduced costs and improved their overall business processes as reflected below.

Customer Testimonial: Agri Marketing Magazine

Our experience in working with Modern Litho-Print for the past two and a half years is one that has been completely transformed by their implementation of the InSite system. With the technology to upload our magazine files through InSite and view page proofs a short time later, our production time has been cut down tremendously. We are able to view high resolution proofs, make corrections and maintain our production schedule while not incurring additional charges. Our company finds the InSite system to be a great asset, not only in terms of being cost efficient but also for providing superior quality proofs. With the InSite system there is never a question regarding the quality product our advertisers will be receiving."

Audrey Evans - Managing Editor/Graphic Designer

Customer Testimonial: National Auctioneers Association

Modern Litho-Print Co.’s page automation process has made a night-and-day difference in uploading and proofing our magazine, Auctioneer, the official publication for members of the National Auctioneers Association. The simple steps Modern Litho set up for the upload, and the way in which we’re able to send corrected pages, has dramatically sped up our production process. We are now sending all pages and corrections in about half a day, and Modern Litho seems to have our magazine on the press in record time following our approval of pages.
through Kodak InSite. We have shaved at least three days off of the production cycle, something that makes our publication more timely, and most importantly, our members happy.

Bryan Scribner - Director of Publications and Trade Show

**Customer Testimonial: Alpha Phi Omega National Service Fraternity**

The automation of Modern Litho's production and approval process has made a positive and significant impact on the uploading and proofing of Alpha Phi Omega's quarterly alumni magazine, Torch & Trefoil. Through the implementation of this automation, we have been able to cut almost four days off our production schedule, allowing our attention to turn to other needs of the Fraternity and its members, which is invaluable to our organization.

Stacey Robinson - Director of Communications

**Customer Testimonial: Georgia Cattleman**

Modern Litho's automated file processing system - offering complete uploading, notification, proofreading, corrections and approval without interaction between myself and MLP's staff - has vastly improved my overall work flow on production of the Georgia Cattleman book and shortened turn-around time from file upload to mailing. Using the pre-set file they provide early in the process, there is no wading through various menu options to create the perfect high res file for them up front. Once the PDF file is generated and the upload started, I can gauge the amount of time needed for the upload, and have the peace of mind knowing I can review and quickly send replacement pages for a second review and final approval, all within a period of time that I control. No waiting for production staff's schedule to post pages and alert me to get back to the computer, since proof pages are, within moments, auto-posted when auto-processed. InSite's preview feature allows me to quickly see exactly how the pages will look when printed, and then Smart Review provides specific details about errors, which I can quickly fix - and send replacement pages which are also auto processed and posted for review and approval. No more costly fixes too late in the game!

I have always felt Modern Litho has done a great job providing guidance and expertise in all areas of production, but their state of the art automation system has made our own system far more efficient and less costly.

Gayla Dease - Graphic Designer

- **Innovation** — It is our understanding that Modern Litho is the only company in the U.S. to have implemented the full Monarch Suite and integrated it with Prinergy/InSite, with bi-directional JDF/JMF data flow. This is the “Holy Grail” of automation that has been the promise of JDF since its inception.

Kodak and EFI have become valued partners for Modern Litho. We continue to work with both vendor partners to improve the integration of Monarch and Prinergy through involvement in beta testing and other efforts.

The primary benefit of these innovations has been a much smoother running operation with increased efficiencies. The result of this work means that 30% of any incremental revenue growth will drop directly to the bottom line, and we are well positioned to grow our business by 25% without investments in additional resources. We are also comfortable that our customer acquisition and retention rates will improve dramatically as these efficiencies become more evident in the marketplace. The testimonials included in this application are clear proof that these efficiencies are already appreciated by customers, and are delivering improved productivity not only for Modern Litho, but for its customers as well.
Appendix A

Simple Floor Plan

Monarch and Prinergy: The Hub of our Operational Excellence
Appendix B

Old Paper Job Ticket (front & back)

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Appendix C

Old Press List

[Image of a press schedule with job numbers and dates]