Annualized Workflow Optimization ROI Strategies Utilizing JDF Technology

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Introduction

With the evolution and introduction of automation including JDF technology, printers must find a way to utilize this technology in some capacity to continue their success and profitability. One of the biggest challenges printers face today is being able to reduce production time while maintaining and increasing profitability. While in some scenarios acquisition or expansion can be the solution, some printers benefit from using JDF enabled technology and integrations. In many cases it is not easy to calculate numerically the Return on Investment (ROI) of this technology and to quantify how this integration will help the business succeed with existing hardware and software combinations. Calculating the ROI on such software while complex has been completed on case studies with automated facilities, which have been entered into the CIPPI awards [1]. Not only can workflow integration be successful and attainable, but also it can at a relatively low cost to hardware acquisitions.

Determining ROI

Determining a ROI for a piece of hardware is relatively easy compared to software applications, especially the enterprise wide applications. When considering the new press, the productivity of it can be compared to the old press and the difference calculated. From this point the productivity differences can be used, along with fixed costs, the staffing and additional costs for running the machine. For software, this approach is much more complex, the solutions touch many parts of the process and the productivity is not known in the current state and the predictions to the new state can be difficult. What can work is to evaluate and determine ROI is time savings and how the facility will become leaner.

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As the industry evolves, one of the differentiating factors for successful printers is the responsiveness in producing the job. Reducing touch points is crucial in a successful integrated facility, and an automated workflow is key to reducing these touch points. Every time a job is touched, money is lost, potential errors introduced, while delaying delivery to the customer. For example, using an automated workflow eliminates the need to re-key basic job information. This information is stored in the database, allowing universal access throughout the facility. Every touch point in the process introduces another non-charged value added touch with the introduction of miss-information. The reduction in processing and waiting time can be quantified into labor savings, which are one of the biggest expenses of a print company.

Removing unnecessary touch points throughout the workflow can be facilitated by creating a value stream map of the production process. A value stream mapping system of the production workflow includes all processes internal and external pertaining to a job (sales, estimate, proofs, production, shipping, etc.). Once the process within the workflow has been evaluated, it is necessary to determine the time each step would take and assess if automation is a feasible or practical solution to remove this added step or touch point within the existing workflow. One of the most mistakes companies make is automating without researching and automating the existing workflow without assessing if this is the optimum one. Not only will value stream mapping identify additional and removing these wasteful touch points, it will make your facility leaner in the process. The process will become more efficient. Finally, once these "value added" touch points have been identified and calculated, you can begin to realize the time savings and ROI of automating processes in your facility.

For the purposes of this paper each company calculated their own ROI. Results were reported for different periods of time ranging from 2.5 months to five years and all numbers were normalized to annual percentage rates. Factors for calculating overhead, wages, amortization and depreciation varied from company to company. ROI averages are indicators and the results motivate change and roughly calibrate expectations.

A discount factor was applied if the reviewer found that not all inclusions in the ROI calculation were directly attributable to JDF automation alone. For instance, in one case only 20% of reported ROI was used, as most benefits had to do with the purchase of a new prepress workflow system, not just the integration of the system with other elements of production.

Labor savings was also tallied. Be aware labor savings are NOT the same as labor reduction, but may also include savings in labor time for processing. Some companies reduced staff, others shifted workers around, and others still just increased capacity. If labor savings was reported in Dollars or Euros, a $100,000 per person or € 80,000 per person was used to determine hours with a 2000 hour staff-year was used as

opposed to a common 2,200 and 2,400 hour-years. Several calculations of hours were direct and not derived from dollars saved on labor, but rather on hours saved per operation, shift, and so on.

Annualized ROI

To evaluate the impact of automation, the set of case studies submitted to the CIP4 CIPPI Awards were analyzed in detail for their ROI calculations. It should be noted that the results from these case studies are coming from leading automation and JDF integrated facilities. All of the facilities showed significant increase in productivity while decreasing the amount of time it took to produce jobs, saving the companies money.

With the different levels of automation, there isn't a need to spend millions of dollars to see benefits in automation. The case studies were broken out into four different levels:

- Level One - Integration between devices. This could include a single integration between two devices. An example would be imposition software to prepress devices. This occurred in many of the early CIPPI award submissions.

- Level Two - Integration between multiple devices. Integration includes multiple devices as well as integrating devices from different departments too. We commonly see this example between the CSRs, estimators, and prepress department. The CSR and estimator will work out of the MIS system. The estimator creates the job and pushes the information to the prepress department. The prepress department uses the information to create the layout and plates.

- Level Three - Full plant automation. The entire facility was integrated into a single, unified workflow. Like level two, only the entire facility has the information and JDF integrated capabilities.

- Level Four - automation with customer connections. Although there was integration with the customer (for example, a web portal or web 2 print connection), this did not guarantee full plant automaton.

The average annualized ROI results from the analysis is shown in Figure 1. As can been seen, the first two levels have a significant ROI and these integrations typically should be those which are quick and less of a challenge to implement while providing the rapid benefits once implemented. Level four implementations also have a similar ROI, though here the implementations are reaching out to customers and interacting prior to the job arriving at the production facility. Having a portal for file submission prevents touch points by placing the time and effort on the customer for file submission. As a reminder, level 4 does not guarantee full plant automation.
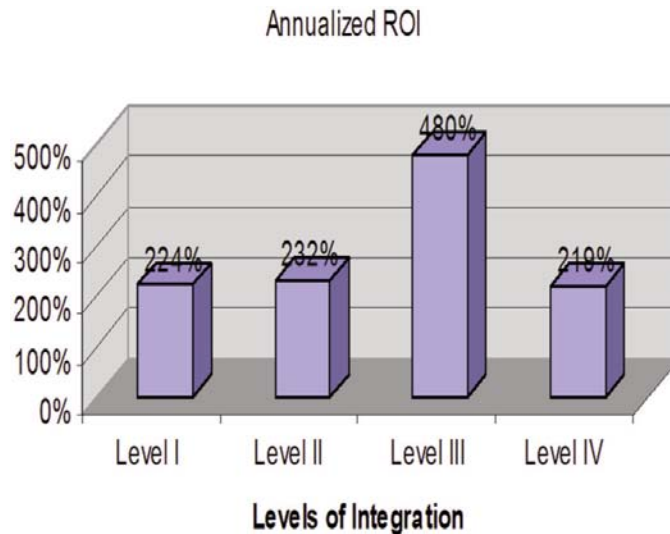
**Figure 1:** *ROI based on integration complexity*

The biggest ROI values come from the complete plant, level three, integrations. Having full plant automation has many benefits, one of the important ones being that all the information captured during production by the devices is being pushed back into the MIS system. Many of the operations that were initially manual have now been replaced, increasing the speed of the product through the plant, reducing the associated costs as well as minimizing errors and repeat actions / jobs. The MIS having this wealth of JDF data is extremely beneficial to the company. The MIS systems reporting capabilities will produce swift changes in the workflow. With the increased management data it is possible to increasing productivity and reducing costs in the facility.

The analysis also calculated labor savings from the different levels of integration and these results are shown in Figure 2, again for each of the four levels of integration. There were significant savings from all levels of integration. Giving the customer control of file submissions, as shown in level 4, provided the largest labor savings. This allows the integration to do many of the tasks for the job, including in certain cases file acceptance, proofing, pre-flighting, scheduling, and estimating independently. The automation also benefits employees who do repetitive repeat work.
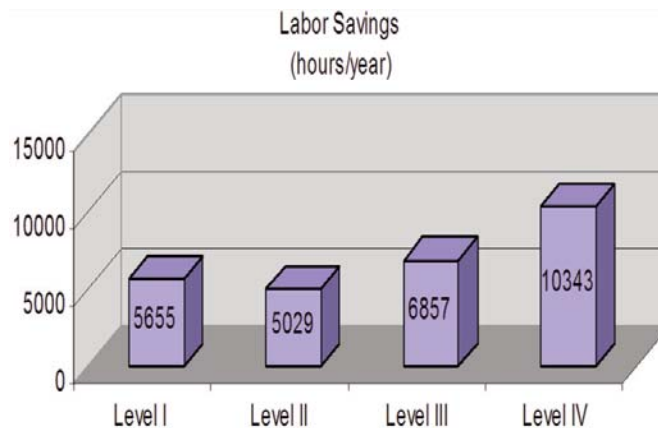
Figure 2: *Labor savings with different levels of integrations.*

This success can happen for many different sizes of printing facilities. The case studies were also analyzed by the size of the companies and the results are shown in Figure 3.
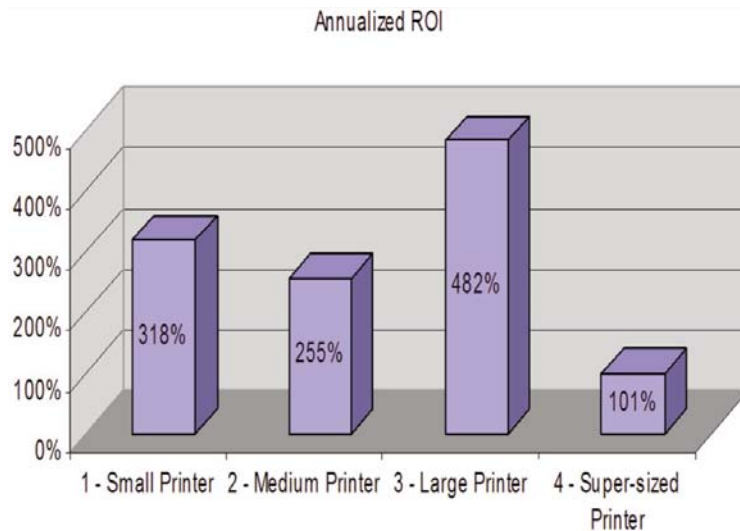

Figure 3: *ROI based on the size of the company.*

In this case, the companies were divided into four different categories:

- Small - No more than 20 employees or less than 7 million USD in sales.
- Medium - No more than 100 employees or less than 50 million USD in sales.
- Large - Over 100 employees or up to 300 million USD in sales.
- Super - Over 300 employees or sales over 300 million USD.

There is no clear correlation between the size of the printer and the annualized ROI as shown in Figure 3. The best performance comes from the large printers, while the super companies show the lowest annualized ROI numbers. These companies have a hierarchy and complex approval process for software integration and this in certain cases may affect these implementations, as well as the high levels of automation these companies started from. The results show that the smaller printer can achieve the high levels of ROI and these have been well represented in the CIPPI awards that have been presented to this size of companies.

When evaluating the labor savings achieved by each of the different company sizes, Figure 4, the results do not correlate with either the company size or the ROI information disused earlier. The results show significant savings from all levels of integration with however, the greatest labor savings came from the super-sized printer. From these results it can be surmised while the smaller companies integrate to expand business and capabilities, super-sized printers are attempting to control labor costs. Their goal for implementing automation is to become efficient, not expansion.
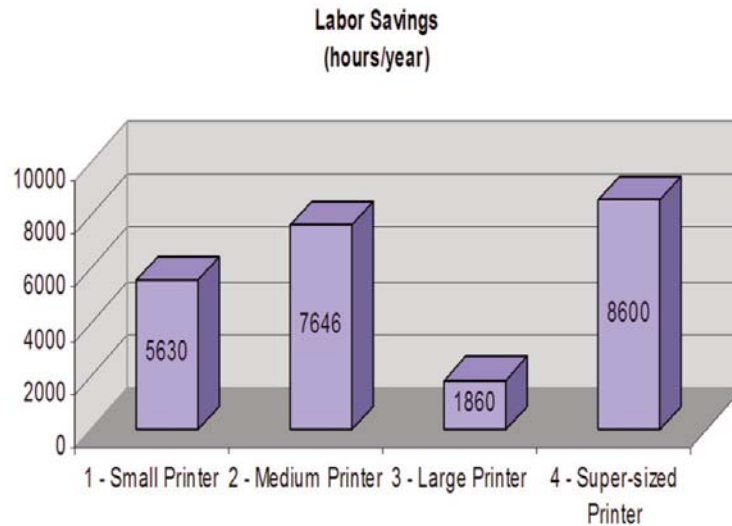
Figure 4: *Labor savings based on company size.*

It should be noted this in the study there was not a consistent evaluation for all printers as each of them reported their own experiences. This provided important data about what is as much about what is important to these printers, what they measured and what they took note of. Some were focused on better pricing and communication to get or keep customers while others focused on internal operations.

Conclusion

Significant ROI numbers were obtained from mangy of the companies involved in the case studies showing that JDF automation provides a fast ROI in all company sizes and also for different levels of integration. This study provides an understanding into the motivating factors and priorities for print executives who pursue a successful implementation using automation. Even if they didn't plan for it, all companies reported labor savings. Labor savings were one of the standout benefits of automation.

After analyzing all the case studies and evaluating the integrations, the average annualized ROI achieved was 277% with a complete ROI in a little over 4 months with the average labor savings for the different levels of JDF integrations is 6979 hours. Automation is the key to driving productivity while minimizing job production time and reducing the time a job is in the facility affects profitability of the job. By decreasing touch points and errors while increasing productivity and turnaround time, workflow integration will make facilities efficient and lean.

Implementing automation does not have to be a long term process and efficient installations can change a business operation and profitability in a very short time period.

References

1.   CIPPI Awards, http://cip4.org/cippi/