

Managing the Hidden Costs of Enterprise Printing

How advanced printing control and management
can directly affect your bottom line

White Paper

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Executive summary

Cutting costs, streamlining, resource use optimization... In the constant quest for profit margin increases, these concepts are examined, evaluated, and applied to individual business processes ad nauseam. Still, the operation of enterprise-level printing has mostly been overlooked. Businesses increasingly notice that after the organization and streamlining of most business processes, printing stands out as an area that is neither controlled nor managed. In global corporate environments, printing is often the last bastion of chaos and complete absence of organization or regulation.

Process streamlining is one of the significant technological impacts on business in the recent decades. Manual assembly, packing, notepads and notebook checklists, punch cards and telephone calls have been replaced by automated production, database-driven IT infrastructures, and recently, the logistics and control have gone as far as RFID tracking of physical item movements during production. Considering the fact that a labeling mistake can completely invalidate all earlier processes (the product quality and production speed are irrelevant if a product is marked and sold as a different item or shipped to the wrong address), the process of labeling truly demands a faultless and flexible control and management infrastructure.

This white paper unveils the potentials and benefits of a modern and technologically supported industrial printing infrastructure. It will briefly explain the recently developed technical advances and how they impact the business end of the equation, and then explain the multitude of layers to label printing systemization.

By the end of the white paper, the reader will have learned about the technical foundations and organizational approaches to develop a label printing system that's on time and accurate all the time, every time, and immediately responds to business-critical errors or technical failures.

A reminder, which labeling errors are business-critical? Indeed, every single one of them.

Definition of Basic versus Advanced Printing Control

Basic Printing Control

Basic printing control is defined by **one-way communication** and physical presence, as it has been for decades. This means that a printer is merely receiver of electronic information, which is sent to it from the printing station. The physical print is produced by the printer, and the operator on-site looks out for errors.

Basic printing systems demand physical supervision if any level of reliability is to be achieved, and networked printers under such infrastructure are not an improvement to the system. While they may be placed in someone else's office, one still needs to walk to the printer and inspect whether the print that was sent to it was created.

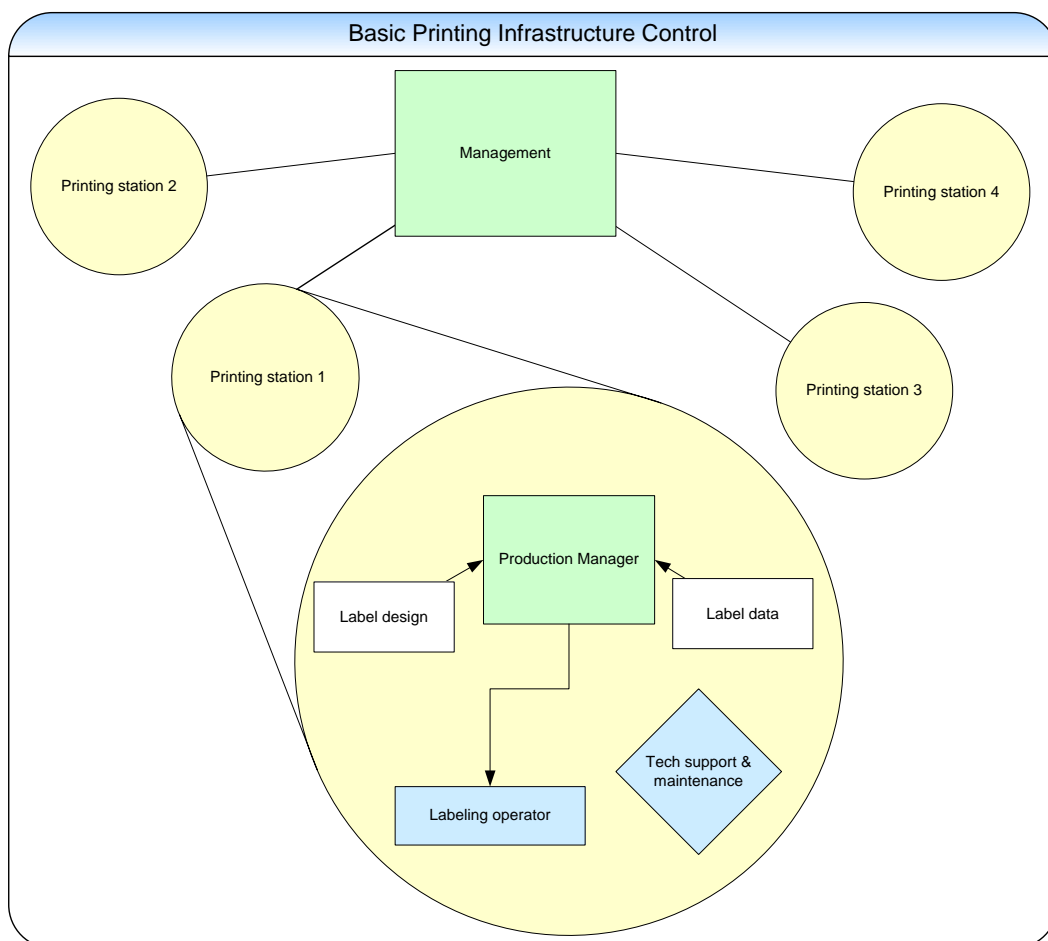


Figure 1: In a basic system, each station requires its own resources and technical support to function

In a modern enterprise, this is equivalent to a computer without a network connection. While it may function independently, it has no means of communication with peers or servers.

Advanced printing control

Bidirectional communication¹

Advanced printing control revolves around a fundamental challenge of the above issue. Just as a computer network is more than a sum of its parts, the printing operations in a company can no longer afford to be completely detached from the system.

Recently, the printer has been redesigned from a data receiving appliance to a communication platform that not only receives data, but is capable of sending data back to the printing platform. Although it sounds as a simple and basic matter, it breathes new life into enterprise-level printing methodologies. At first glance, there is no excuse for having tolerated outdated methodologies in modern enterprises for so long; however a more detailed look into the subject reveals the difficulties that printing faced until recently.

The printer hardware, printer driver, and the software that is used to operate and coordinate the printer system as a whole must all fully support bidirectional communication. As enterprise printing is done on professional and specialized equipment, the path to achieve this coordination on a broad and universal scale was highly complicated. Even today, not all drivers and software succeed in utilizing this new printing functionality.

The ability of the printer to send relevant information to the printing station (bidirectional communication) is primarily intended for status reporting. This means that the printer is able to **identify its own status and report it to the host computer**, which forwards this information to relevant parties. The need to physically supervise printing processes is thereby eliminated, and “enterprise printing” can finally move into the age of structured IT and business systems.

Remote Operation

Bidirectional communication is a prerequisite for any true remote or networked printing operation. It represents the benchmark of a new era of printing operations and is the pillar upon which present and future business operations will base their printing activities.

It removes the need for physical supervision of every printing task, and integrates the printing operation into the structured and technologically supported production system. Such printing fulfills the requirements of IT-supported production and handling, making printing one of the many automated stages the product goes through.

This is particularly important in labeling operations, where printing used to represent an unsupervised bottleneck where human response times and human error represented a constant disturbance in the work process. With proper IT integration of label printing activities, the frequency and business costs of printing errors are reduced drastically.

¹ For more information on bidirectional communication, see the white papers listed in the **Appendix**

Additional Functionalities

Modern IT support also opens the door to new functionalities which are by now taken for granted in other work processes, but were until recently sorely missed in enterprise-level printing. The capability to centrally track, supervise, and log operations offers managers and production supervisors the sorely missed oversight and control tools. Every printing activity can be automated and logged; every printing error can be reported by the system instantly, rerouted or resolved; individual print jobs can be repeated at any time to other printers; printing processes in several locations can be coordinated, uniformed, and centrally guided.

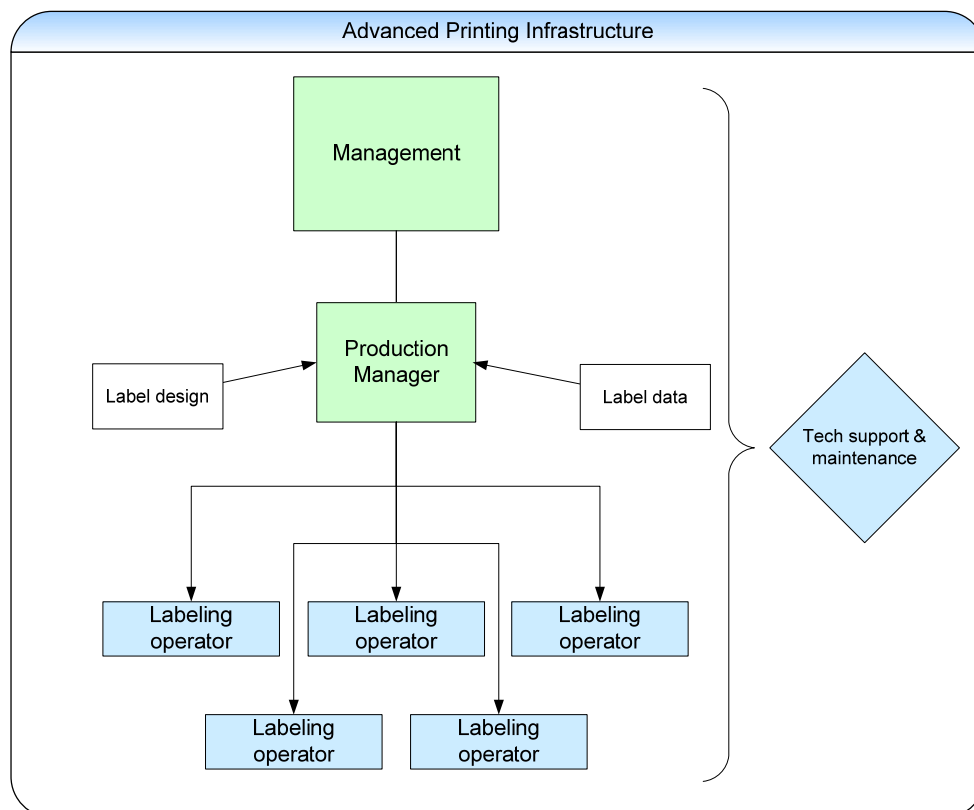


Figure 2: In an advanced system, the resources and technical support are shared by all stations, drastically reducing running costs and committed resources

Practical Applications of Advanced Printing Control and Management

In order to define the true business value of advanced printing control, one needs to not only answer the questions on how it translates into revenues. Rethinking and reevaluating the printing strategy demands that the correct new questions be asked as well. The criteria that the printing infrastructure should meet are no different from the criteria that are demanded of accounting, sales, assembly, shipping, and similar operations. Printing has evolved into an equally supported work process, and it should live up to all the standards demanded of other processes.

For more information on individual solutions developed by NiceLabel, see the papers listed in the **Appendix**.

Centralized Technical Oversight of Complete Printing Infrastructure

Fewer dedicated technical staff

The first and most obvious benefit of central technical supervision of printing processes is central technical assistance. The direct access off technical staff to remote printer statuses removes the need for on-site technical support. Operators can focus fully on operative tasks, while technical issues are diagnosed centrally by technical personnel.

Higher Qualification of Technical Oversight Staff

As suggested in the paragraph above, the staff supervising the technical aspects of printing controls all printing operations remotely from a central location. The absence of technical support on every printing location allows for part of these resources to be invested into better and more qualified central supervisors. Not only does this result in higher reliability of the printing infrastructure, it also allows for faster and more accurate solutions to technical issues, reducing costs of downtime and technical costs.

Instant Top-level Reactions to Technical Issues

As the system's central supervision assumes command, issues are not resolved by on-site speculation, consultation, and finally an awkward forwarding of information between a semi-qualified operator and a technical support professional. They are addressed instantly by the controlling party, who can diagnose and solve errors independently.

“The package labels are blank.”
“Is the green light on?”
“What green light?”
“On the left side of the printer.”
“The big printer?”

No modern enterprise can afford to have such telephone discussions while production stands still.

Chain of Command and Control

In a fragmented labeling system, the responsibility for optimal printing performance is carried by a broad group of people. The people designing the labels, the people deciding on label content, the operators physically running the printers, and other staff are all involved in the labeling process. None of them answer to a central authority, every breakdown of the system

needs to be painstakingly examined by top-level executives and production managers. A centrally guided printing operation allows for a centrally responsible person who coordinates all of the printing stages and staff. This person can report to their superiors on individual matters and the system as a whole, as well as analyze performance information and plan improvements. The chain of command and responsibility can be established for printing in much the same way it's applied in every other business operation.

Organized Prevention Measures

Centralized technical oversight is crucial in order to minimize faults, foresee issues, and streamline production. Keeping track of consumable stocks, expanding or narrowing the printer fleet, identifying repetitive technical errors or operator mistakes all demand a birds-eye-view of the complete printing operation over time. These are crucial measures that reduce downtimes and delays to a minimum, as well as optimize the use of technical resources.

Advanced Error Handling

If a specific print fails to start because a printer is paused, offline, or incapacitated due to a technical error, the printing operation can automatically be rerouted to a working printer. Furthermore, if a printer error stops a continuous printing activity, the system is notified of the error, and the task is routed to another printer.

Not only is it possible to notify the administrator of errors in the printing infrastructure, the integration of printing into an IT-supported system allows for scenario-based handling of errors.

Without bidirectional communication, the printer has no way of reporting an error to the system, and the printing activity simply stops until someone notices it, potentially halting the production line and other processes until the issue is resolved. This leads to unnecessary costs and in systems that function continuously with high throughputs, such events can have a catastrophic effect on production output.

Centralized Operational Oversight of Printing Infrastructure

Once printing is properly integrated into the company IT system, its general performance can be tracked and evaluated. The delays and costs caused by printing delays within a certain time can be established, analyzed, and managed to live up to expected quality standards.

Tons of individual improvements to the system's integration into the business processes of the company should bring about positive results, and improve the reliability and performance of printing in general. A cohesive view of the complete printing activity as a sum of many individual print jobs and locally independent printing locations is needed in order to accurately evaluate and forecast the increases in availability, performance, and the reductions in incurred costs.

Centralization of Work Processes and Interconnectivity

There is no reason why printing should not be subjected to the same centralized organizational structures as every other business process. Each stage of development or production is a piece of the broader business system, with its own requirements, benchmarks, demands, and standards.

Errors, delays, costs, breakdowns, efficiency, and many other standards by which we evaluate the optimization of a business process all have a direct impact on the bottom line. Without a centralized connection, layers of performance can't be reliably evaluated, much less tracked over time.

Workload Oversight

Once the printing infrastructure is integrated in the IT system of the company, this opens up a limitless spectrum of planning and supervision options. One of such options is using graphical representations of workloads in several locations where printing takes place.

The impact of such oversight on the bottom line is presented in the form of resource utilization. If the activity and workloads of two locations are complementary, meaning that one has the capacity to consume the workload of another, the printing activities can be concentrated in one location. This frees up not only physical resources, but also impacts consumable storage, shipping and ordering, rationalization of staff assignments, etc.

Control of Consumable Consumption and Stock Levels

While every serious printing infrastructure does have some level of tracking applied to levels of consumable stocks, an IT-based system can offer significant improvement.

Not only does the tracking of stocks coincide with other centralized stock tracking and ordering activities, the system is able to evaluate the stock availability on the basis of printing logs and estimate when the stocks will be depleted. Obviously, the system is then also able to send out detailed alerts with depleting stock warnings to relevant personnel.

Coordination of Printing Hardware Modernization

Comparing required printing workloads with printing capacities in individual locations makes it possible to identify areas where expansions of infrastructure are needed before congestion begins to slow production. Likewise, it is possible to identify locations where the technical infrastructure exceeds the printing needs and redirect some of the technical resources to printing locations where they would be more optimally utilized.

A strategic approach to resource optimization results in better utilization of existing resources and reduces associated operating and upgrade costs.

Once all printing activities are visible, it becomes possible to develop and evolve the system. The performance needs and maximum printing capacities can be defined and planned for the future, expanding or narrowing the printing operation to suit the business needs of the enterprise.

Central Access to Print Jobs and Resources

A centralized printing system makes it possible to share resources between independent printing operations. This means that all IT resources in a label printing environment, such as label templates, images, and configuration files can be concentrated and controlled in one location.

In a truly networked printing system, when such a resource is updated, it is automatically used in all printing locations from that time on. This significantly lowers the logistical strain on printing process management and focuses changes and updates to a single location from which it is automatically applied across the organization.

Centralized Printing Processes and Tasks

Having pointed out the benefits of technical centralization and operational centralization, one aspect remains. It is the centralization of processes and actual work that is done in preparation before the actual printing begins². These operations can be a major resource drain in a company with a fragmented printing system.

Centrally Coordinated Label and Print Job Production

The first and most obvious step taken in centralized systems is to identify the operations that all distributed parts have in common, and then establish a strategy of concentrating these operations in one location. If each printing operation in a broad system relies on its own operating resources and processes, this presents needless costs and slow response times, increases risks of errors, and similar complications which are inherent in any uncoordinated system.

Every business operation has a defined and predictable chain of command. The strategic decisions and oversight are dictated from the top of the pyramid and distributed to various stations below. If each such station is independent and neither connected to the top or each other, effective work processes are an impossible goal.

Reuse of Design and Logistical Resources on a Global Scale

In a centralized labeling or any enterprise printing system, it is imperative that resources used by various printing operations are shared.

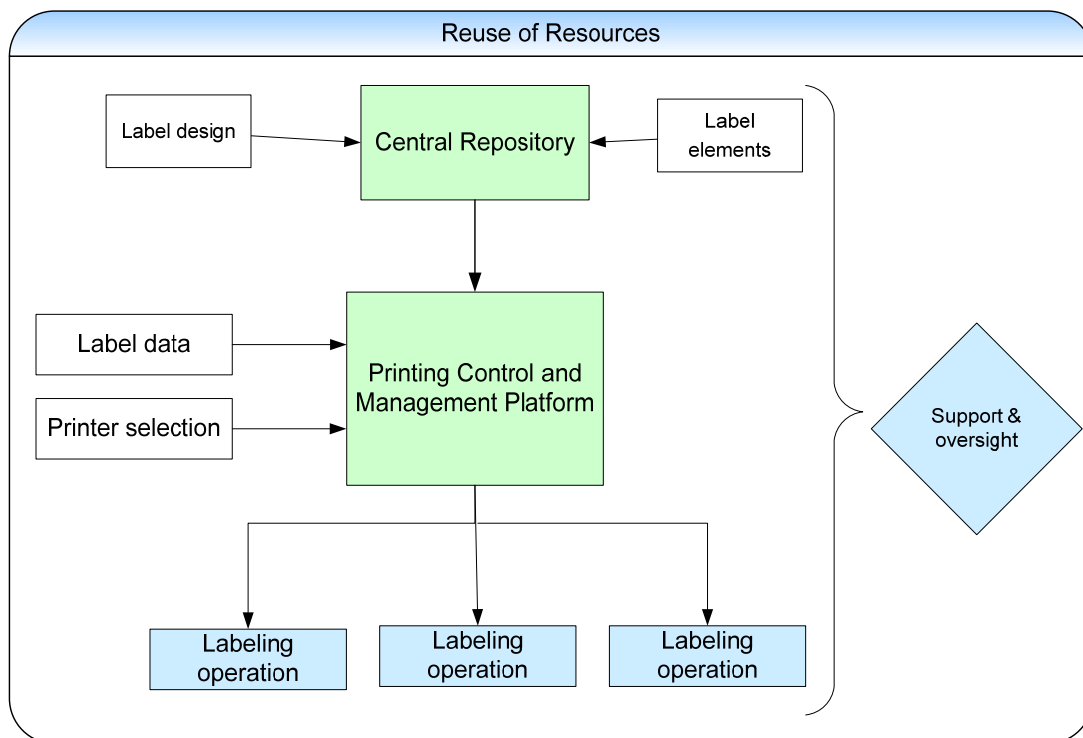


Figure 3: Resources are managed and used centrally, allowing for system-wide policy decisions and management

² This aspect of centralization mostly depends on the software used by the printing platform. For some examples of NiceLabel solutions, see the documents listed in the **Appendix**.

For example, most successful enterprises use unique and strictly defined logos and letterheads. When they are changed, everyone that uses them must apply them immediately. In this way, they are not created for each document, they are always the same, and there is a system in place to guarantee that.

Whereas a company logo and letterhead may very rarely change, labeling is a much more dynamic operation. Labels change momentarily and sometimes daily, their format and the information they contain are paramount to the image or intent of the product they are placed on.

In order for a labeling operation to be effective from the top level, deciding on what labels are needed, what they should look like and what information they contain, to the bottom level, when identical uniform labels can be produced on any printing platform, at any time, without error, the system as such must share the resources it uses.

Centrally Defined Printing Practices and Regulations

Once a business system is centralized and streamlined to maximize the reuse of resources, minimize logistical strain and allow proper guidance and oversight, it must still be guided and managed. Central guidance of printing practices offers management actual control and oversight over the complete process, and eases the logistical strain when such insight is needed.

Instructions and policies are transferred from the top to every station on the very bottom of the chain in one step, and feedback on the effects of these policies is available through the system as such, rather than through dozens of personal inquiries and reports which have to be managed and organized.

Conclusion

Modern enterprises require printing on all levels of their business operations, and for the most part, they are adequately organized and supported. Labeling, however, has very specific requirements and business implications. It is an integral part of the production or logistical infrastructure, which introduces very specific demands.

Automated production and logistics demand impeccable accuracy, flow control, and organization in order to achieve the highest possible levels of efficiency and performance. These requirements expose the intolerable weaknesses of the average labeling system and the needless costs that fragmented labeling without standard compliance, coordination, and centralized control imposes on the work process.

The advent of bidirectional printer communication introduced a new age in labeling and its application in enterprises, finally allowing this business-critical process to catch up with the business practices of the 21st century.

NiceLabel has been among the first labeling software producers to recognize this development as a groundbreaking one and has taken charge with its Enterprise Series product line, the cutting edge in labeling cost and quality management, grabbing the attention of some of the world's most demanding and successful enterprises.

Large or small, no enterprise can afford to overlook the increased costs of production downtime or labeling errors. There are few valid excuses for how these operations were organized until recently, and one would be hard-pressed to come up with a single one for the future.

Appendix

Additional Resources

Additional documentation is available, detailing the individual NiceLabel products and industry solutions. As any detailed documentation of these processes also depends on the individual solution, the examples and workflows in specific documentation are based on NiceLabel products and the NiceLabel methodology of enterprise-level label printing performance and automation. The documents are available at <http://www.nicelabel.com/Learning-center>.

Papers:

- NiceLabel Advanced Printing Control Solutions
- White Paper: Understanding the Essential of Label Printing Performance
- White Paper: The Concerns and Benefits of Label Printing Integration

General NiceLabel resources

- [NiceLabel Web site Learning Center](#)
 - [NiceLabel Tutorials](#)
 - [NiceLabel Technical FAQ](#)
 - [NiceLabel Technical Support site](#)
 - [NiceLabel forums](#)
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