

Printing labels from SAP ERP:

Solving a common issue with a structured approach

White Paper

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Executive Summary

Label printing from SAP is always a touchy subject, in part due to a common lack of understanding of how the label printing operation fits into the modern enterprise. SAP as such is a complete ERP solution for medium-size and large enterprises which handles just about any IT-related task that's thrown at it. Its ability to support practically all potential operations of the modern business is based in its amazing flexibility and adjustability, which in turn demands significant investment and setup efforts.

It's no wonder that the users of SAP ERP demand that their high-end solution covers all of their needs. This is where the label printing conflict arises, as SAP does not and can not support all eventual label printing operations. As such, label printing is no more an integral part of the IT operation than shipping or warehousing. SAP ERP supports all of these activities by providing them with the appropriate data, but it does not itself print labels or move boxes around the warehouse.

This white paper will illustrate how a successfully integrated labeling solution is not the archetypal third party software that everyone tries to avoid, but rather a self-sustained operation that seamlessly works within the SAP ERP infrastructure. While we don't expect every operating system to include a state-of-the-art word processor, we do expect the application to function perfectly within the system, and demand that its interference in the system is limited to a single icon click.

The Immediate Benefits of Label Printing Process Integration

Price

To pick one example from a pool of thousands:

"[Sam's Club] reduced the fee for each pallet it receives without a radio frequency identification tag. The retailer will now charge 12 cents, instead of \$2.50.

The reason, according to Simon Langford, Wal-Mart's director for EPC and RFID technologies, is that the retailer has integrated EPC RFID tagging into its own operations, so the cost to Sam's Club is minimal.«¹

The retail chain demanded that its suppliers affix all pallets with RFID tags, and not only did it charge the suppliers who failed to do so for the RFID labeling that was done upon delivery, it announced that they would increase this price to \$3.00 by 2009 in order to cover their costs the following year.

In a sudden twist and a display of resourceful cost management, their announcement in 2009 instead set the cost at \$0.12, which is the total RFID labeling cost of their integrated solution.

"Twelve cents is our net cost," says Langford. "That's a powerful message for anyone out there starting to look at EPC technology. You can tag cheaply if you integrate into your existing processes."

Logistical Strain and Reliability

Integration of an operation is by definition the opposite of running a parallel operation to the existing one. The company from the above example (presumably) previously maintained a parallel label printing operation, which caused it to invest significantly more into labeling than was necessary.

As a parallel system is operated and maintained separately, its increased cost is followed by additional strain on the management and physical operation workloads, needlessly complicating the operative issues, as well as introducing countless additional opportunities for human error and other problems that plague complex enterprise item operations.

¹ [RFID Journal](#)

Why and How to Integrate Label Printing into SAP ERP

Why

Business considerations

Failing to integrate label printing into SAP ERP limits the enterprise to the few natively supported procedures, which carry drastic limitations:

- complete absence of visual label design, depending on programming design to create truly archaic labels which force your packaging and shipping to adapt to the labeling process instead of the opposite
- minimal flexibility of all label printing operations, including label creation, alteration, adaptation to a new printer, operation scaling, and similar, as they all require extensive manual programming
- labor costs needlessly apply to the simplest of operations, demanding advanced programming work
- poor quality control and assurance, as the basic natively supported labeling operations are of the “fire and forget” type, failing to flexibly report printer failures, errors, or data transfer issues

Technical reasons

Label Printing superficially appears like a fairly trivial operation. Once one examines the basic premises that define it, its baffling complexity becomes apparent. To list but a few facts, which are usually overlooked:

- laser and ink jet printers can't print single labels without resource waste, are much slower than thermal label printers, and their TCO (total cost of ownership) far exceeds that of thermal printers
- thermal label printers are not supported with default Windows drivers
- dozens of established thermal printer makers offer label printing hardware, each carrying many different models
- each printer manufacturer uses his own programming language for printer control and communication
- there are stunning differences between “thermal label printers”, ranging from portable to desktop and industrial applicators, from paper stock label printers to card printers and textile tape printers, from locally connected to network and wireless printers, direct transfer to thermal transfer printers, and so on ad nauseam
- thermal label printers are a quickly evolving high-tech hardware product, however the individual printer is expected to perform for years to come (this introduces a constant issue with device software support, which is needed for both the newest releases, as well as printers which have not been manufactured for years)
- performance and quality often demand the use of internal printer capabilities, such as image storage, label template storage, date and time functions, incrementing counters, etc

The above considerations are all contributing factors, which show why support for the dynamic label printing industry is a constant activity, which demands continuous development by dedicated industry professionals, in order to keep enterprise label printing running without a glitch, regardless of the hardware they use.

How to Print From SAP

There are 4 primary methods, 3 of which are direct solutions with very distinct drawbacks, and one integrated solution.

SAP Smart Forms

While this method is fairly easy to apply to label printing, as well as reasonably flexible in its application, it uses a significant workaround to deal with broad varieties of printing infrastructure. SAP Smart Forms provides a rudimentary graphical design interface and supports variable values, but has very strict limitations to the printers it is able to use. It doesn't feature broad support for the various thermal transfer printers, and uses a workaround with any printer that is not natively supported by SAP.

It translates the label design into an image, which is broadly compatible, but this introduces two significant limitations.

Firstly, image files are significantly larger than data files, slowing down the printing process.

Secondly, label printing is a part of data and product handling processes. Limiting oneself to image formats prevents all subsequent data handling, most quality control measures, tracking, etc. Paper, microfilm, and scanned documents have been replaced by digital content in enterprises a long time ago, and going back to such a rigid format reintroduces many of the drawbacks that aren't tolerated by the modern enterprise.

SAPscript (ITF Method)

SAPscript seems to be the diametrically opposite solution to the SAP Smart Forms mentioned above. It provides decent data management and optimization, as well as appropriate handling of data and printers.

Sadly, it is inately rigid, demanding highly complex manual programming of label printing operations, as well as any changes to them. The simplest of issues, such as an update of a data field, image, or any label printer hardware change usually requires 3rd party consultants, which program the script.

NiceLabel does provide some relief to the users of this method in the form of label design and import. The label designer supports the export of a label designed inside NiceLabel (and translated into the language of the printer of choice) in the SAP .ITF file format, in which SAP ERP recognizes the variable data fields. This relieves the need for constant programming, but retains some limitations to flexibility, as any import process must be repeated when a label design changes.

There is another minor drawback to the ITF method, based in the fact that the ITF file is a text file by default. Some printers languages use binary code for commands, and while there may be alternatives and workarounds, this complicates the process. Furthermore, some printers cannot include image data in non-binary format. This means that in some cases, the hardware is subjected to the demands of the process, which impedes flexibility.

This method is successfully leveraged by environments which do not change or add label designs frequently, and are (in some cases) comfortable with adapting their hardware to suit the limitations of the process, rather than polish the process to adapt to any hardware environment.

Integrated Method

HTTP infrastructure

Technically, this is where label printing »integration« begins. This interface is supported by certified solutions of major printer manufacturers and software vendors which specialize in AIDC (Automatic Identification and Data Capture). Both industries provide solutions with device controllers which are able to use a HTTP connection to collect data and translate it into printed labels of any design, at any given time; however the printer manufacturer products tend to be brand-specific or even limited to certain printer models, while the specialized software can be applied to just about any printer.

Integrated printing through HTTP offers:

- the design capabilities of modern design software, with a visual interface, allowing the average user to quickly create and position elements on a label
- unsurpassed flexibility, where a printer change requires merely the selection of the new printer from a list in SAP ERP, and the label printing process continues without delay
- support for virtually all label printers, as the drivers are developed and maintained externally and installed with the device controller
- the device controller communicates with the label printing hardware and reports errors, stalls, completed print jobs, statuses and similar, providing crucial Quality Assurance measures and minimizing system downtime
- automatic gathering of exported business data from SAP ERP, unsupervised and uninterrupted label printing
- the ability for label printing to be controlled and initiated not only remotely but on a truly global scale

The benefits of an integrated solution are based on workload management. A device controller captures the data provided by SAP ERP, and inserts it into the labels, which are encoded to suit the individual printer automatically. This method therefore provides optimized label printing, the highest possible level of flexibility, simple yet advanced design, and of course, complete adherence to SAP standards and work processes.

SAP All (Auto-ID Infrastructure)

All is an interface included in SAP NetWeaver, allowing SAP ERP partner device controllers to perform RFID detection and label printing. SAP communicates via XML data exchange in order to connect the SAP business-oriented documents with the device controllers, which perform the physical label printing or RFID detection, and then report the status of the operation or collected data back to SAP.

A SAP All connection functions roughly in the same way as the HTTP infrastructure, and the only significant difference lies in how it manages XML data. All features a standardized pre-defined XML structure, allowing device controllers which support it to automatically identify the individual data strings in the transferred XML file.

In the case of label printing integration, it removes the need for custom XML structures and data filtering, eliminating a significant portion of the setup process with a data infrastructure that both SAP and the device controller understand.

Can You Truly Afford to Ignore Integration?

Printing labels is possible from SAP ERP without external design or device controller integration, there is no doubt about that. It has been done by many for years, and in some companies, will continue to be done in the future. Still, failing to streamline processes and optimize the costs and workloads imposed by them are one of the many indicators of business failure.

The modern enterprise seeks to optimize its processes, and an enterprise which has invested heavily into implementing a complete SAP ERP solution in their company is usually one that values the invisible merging of daily business operations into one comprehensive and transparent system.

Label printing is often a major pain in this respect, demanding that all of the benefits of optimizing enterprise operations be overlooked at the very end of the product chain.

Modern enterprises increasingly see that a proper device controller, developed by label printing industry professionals, seamlessly and effortlessly integrating with the ERP, developed by the business IT professionals, is the optimal way to remove the stress and delays caused by many label printing operations.

Appendix

Additional Resources

Additional documentation is available, detailing 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>.

White Papers:

- White Paper: Managing the Hidden Costs of Enterprise Printing
- White Paper: Understanding the Essentials 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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