the professional
labeling software

NiceLabel

The Concerns and Benefits of Label Printing Integration

How you can make the most of it

White Paper

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1 Executive Summary

Integration. It's one of the buzzwords of modern business management, but how is it applied in practice? Integration theory has come a long way, but when faced with the need to apply it to an individual service, the books and methodologies rarely address our very particular needs.

Large enterprises have long realized the importance of system integration in supporting their business and their quest for profits, combining different software solutions into unified systems.

This paper introduces the reader to the basic methods of label printing integration, explains their very distinct primary uses, limitations, and benefits, so that he is able to identify the type of integration best suited to his own business.

The explosion of business globalization and the evolution of data management and planning in the recent years are introducing labeling as a business-critical operation for many smaller and medium-size companies, which in turn raises the question of how to implement this new process into an existing business operation.

Understanding process integration becomes a vital factor in deciding how the labeling process can be implemented, and with software integrations, there are about as many ways to integrate as there are companies on the market.

A business without an existing labeling solution rarely has the software support required for its implementation, and labeling tends to be heavily dependant and intricately connected with data collection and management. Hasty approaches or even legacy applications will often become a constant hurdle in both data management and workflows, not to mention, a bloated burden on the financial and HR aspects of the business process.

When the correct type of label printing integration is applied to an existing system, it will become a seamless part of the existing system. It will function as if it was developed specifically for the given system, and most importantly, it will adapt to the business it supports instead of the other way around.

2 Integration Challenges

When deploying an automatic identification and data collection (AIDC) software solution, a customized or integrated label printing approach is easier to implement and maintain than any off-the-shelf bar code and RFID labeling software.

However, such an integrated system imposes the following considerations:

- How to manually or automatically access the data already present in the system's data streams, database storage, external devices, and other locations?

- How to process the information? The information needs to be filtered and parsed from its raw form into a form which can be used by the printing functionality.

- How to control the printing engine and how important is the throughput capacity of the printing system? Will one print engine and print thread be sufficient, or is there a need for simultaneous processing and printing of large specters and volumes of labels?

- How to print labels to any thermal or laser printer within your company directly or through your company network or the Internet?

- How to print labels automatically without operator intervention and how difficult will it be for an operator to use the new system?

In many cases, label printing jobs throughout a company use data that has already been collected and stored somewhere in the IT system. One might have to add a separate label design application, but the primary aim is to integrate the label printing operation into the existing IT system and applications, which the users already use on a daily basis, or are at least familiar with.

The integrated label printing operation should run automatically, so that end users and operators are practically unaware of the label printing application running beneath their usual system. It should also be able to function independently, gathering data from the existing system on one or more channels, filtering and adapting the data to a uniform shape.

The most demanding environments demand automatic initiation of printing of a broad spectrum of different labels on several different printers in the local or global infrastructure. All of this should be done with minimal staff intervention or completely automatically, with mere supervision and troubleshooting carried out by technical staff.

Integrated solutions are lurking on every corner since the expansion of the business, and the clients looking to implement such solutions are largely unsure which choices are right for them due to a lack of process-relevant information on the topic.

**Modern information systems face new integration challenges.**

Software applications and IT systems grow and companies add more and more applications to their software pool in order to meet the requirements of their business environment.

The policy of simply adding software eventually leads to an exceedingly complex IT system that combines legacy, off-the-shelf and customized applications. Such inflation of IT infrastructure brings ever-increasing costs, as each of the systems is accompanied by maintenance, support and training costs, not to mention a dramatic increase in work hours and employee workload invested into keeping such an extended system afloat.

To better control the growth of their IT systems, companies demand integrated solutions which can seamlessly perform the services they need and integrate fully into their existing IT infrastructure.

3 Label Printing Integration Methods

In order to understand label printing integration, we must first look at the basic components of the label printing process.
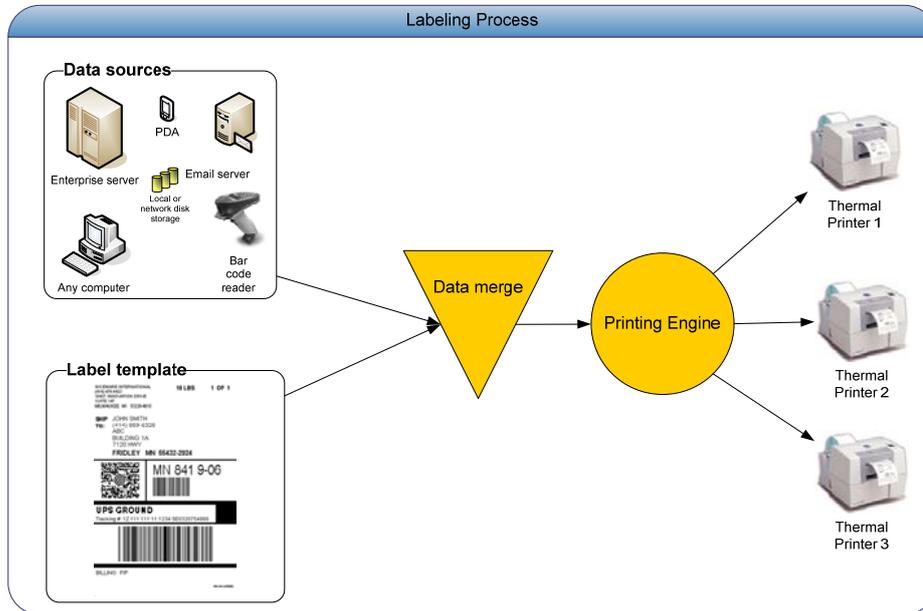
Labeling is a complex process where the 2 core technical issues of the user need to be resolved:

- Automatic introduction of various types of data into the label template

- Flexible final output that is not limited by printer brand or type

The model of integration of labeling largely depends on the label creation and printing output phases, particularly in any situation where the labeling process requires fast creation of different label content.

There are three basic models of labeling integration, each catering to specific needs and resources of the user:

1. **Programming Integration method**: changing the programming structure of the existing system

2. **Non-programming Integration (middleware) method**: adding printing functionalities to existing applications

3. **Direct Printing method**: exporting label files to third party applications, printers, Windows mobile devices, SAP R/3 system, etc

3.1 Programming Integration

The Programming Integration method is best suited for users, who:

- Demand the absolute maximum flexibility and accessibility of all labeling operations

- Demand that the labeling process be absolutely in line with their current work methods (system operators being practically unaware of the system expansion other than the simple added printing commands)

- Have the resources needed to alter the core programming of their existing system and incorporate the labeling solution of choice into it

The Programming Integration method offers:

- An unprecedented level of customization and flexibility

- Complete and uncompromising integration of systems, allowing for some status reporting and return-information forwarding not available to other methods

- Near-infinite adaptation potential as the host systems evolve, direct access to the levels of integration and interaction of components.

This method of integration is by far the most powerful and flexible of the three, offering a level of flexibility that is only limited by the user's imagination and programming skills, but at the same time, requires the greatest commitment of programming resources.
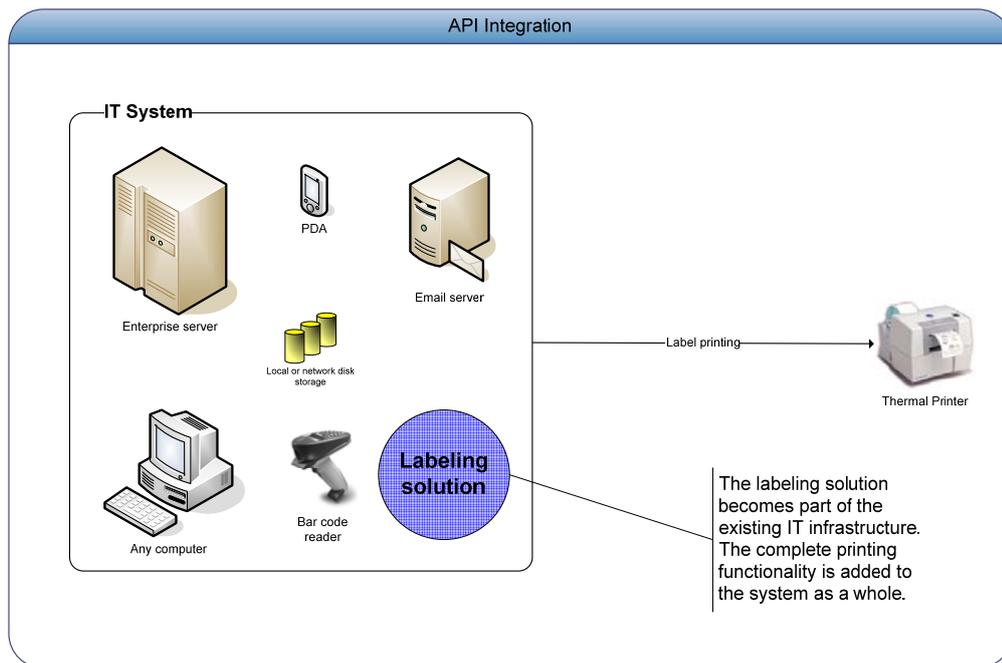

Figure 1: Programming integration

This method of integration, of course, is mostly suited and recommended for situations where the system can't effectively handle a middleware solution, or where one would not be powerful enough. While the system changes do provide an unprecedented level of integration, the programming method is slower to adapt and adjust to changes in the system, as it needs to be re-programmed.

3.2 Non-programming Integration

The Non-programming (Middleware integration) is best suited for:

- Organizations for whom integration into the source code of the existing system is too expensive or simply impossible

- Organizations that require a solution that is easily set up and maintained without constant programming intervention

The Non-programming integration method offers:

- Extremely broad capabilities of label data collection and processing and printing

- Quick setup and configuration of the system, as well as the possibility of quick adjustment to needed changes in the workflow.

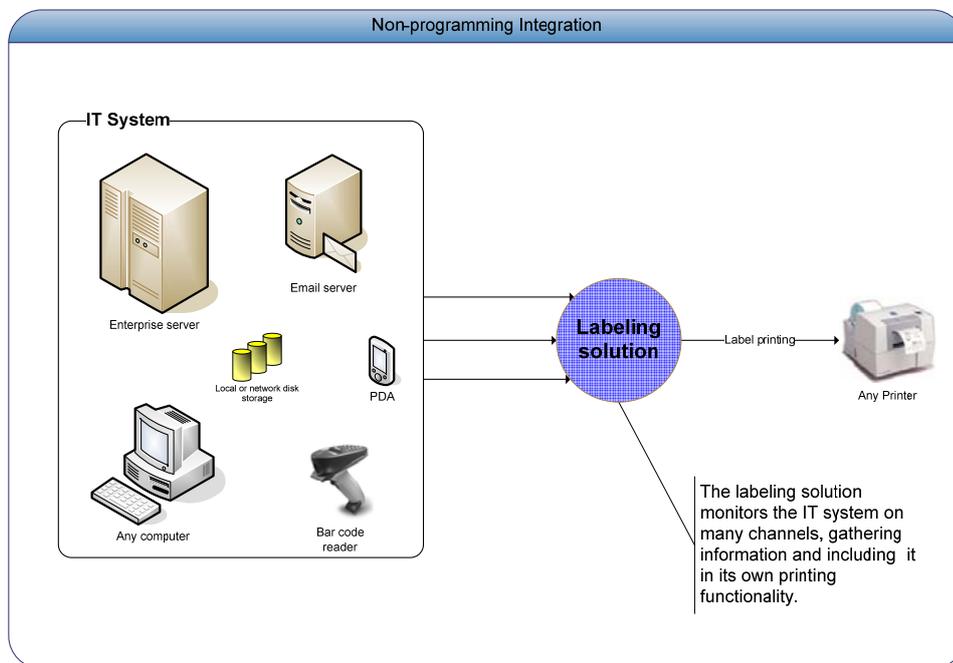- A modular cross-platform systemic solution that can be moved to a new system, upgraded, or migrated

Figure 2: Non-programming integration

A middleware module traditionally captures the labeling data from most types of communication channels in the existing systems, ranging from files and databases to scanner communication and TCP/IP communication or e-mails.

The middleware module is the key player in connecting the existing system with the printing process, reaching out to both ends and handling the flow of information between seemingly incompatible systems.

3.3 Integrating Standalone Label Printing

The direct printing method is a somewhat different integration approach and applies to:

- Users who see label printing speed as a key factor

- Users who are unable to use any 3rd party software

- Users who already have full printing functionality, but lack advanced label design

The direct printing method offers the following:

- Labels are designed and stored in the printer or existing system

- Unparalleled printing speed due to the smallest possible quantity of transferred data when the label is stored in the printer

- No 3rd party software necessary after the label is created and exported

For example, if the SAP R/3 system does not include a user-friendly label design tool, the label can be designed with a label design program and exported to the SAP R/3 system for printing. Other export options include third party software applications, stand alone printers or Windows mobile devices. The exported label is processed in the third party application or uploaded to a printer for printing.
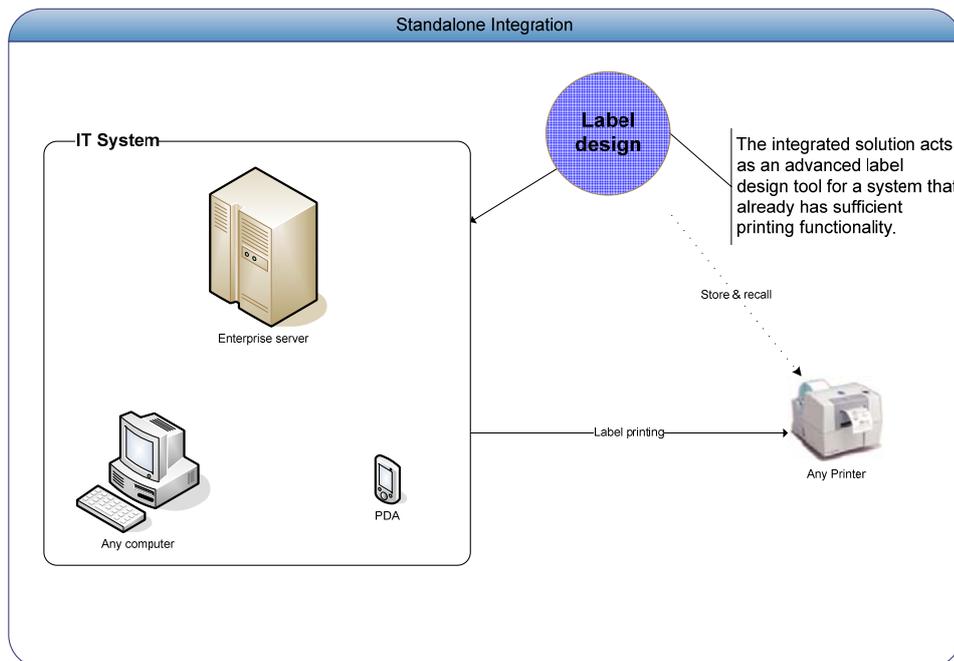

Figure 3: Standalone integration

This system of integration is often easy to implement, but offers practically no flexibility. Any changes in the system may require a complete redeployment of the system, and the label options are always limited by the constraints of printers and existing systems. This method of integration is mostly aimed at those that either demand printing speed above all other factors, or those that are for whatever reason unable to apply one of the previous methods.

4 Conclusion

As hard as it may be to put one's finger on Integration and how to apply it to a certain business practice, it is a very real issue. Process integration has been pushed into daily affairs by the increased competition on the global market, the constant drive to increase profits, and the increasingly important lynchpin of ROI considerations.

The domain of "global business" once dominated by the select few multinational companies has long become accessible to everyone. Integration of business processes has followed suit, and many companies struggle with this new concept.

The basic labeling process does allow for a basic breakdown of the potential points of approach to such a solution, and as the paper has shown, the choices are very much different from one another. Each method of integration as described above is very different from the other two, and even once one is chosen as the closest one, the priorities of the company performing the integration need to be reexamined. The paper provides the contrasting comparisons between the methods so that one may take a more case-oriented approach in deciding how to integrate label printing.

If the method of label integration is chosen with care, an effectively integrated labeling solution will provide benefits that far surpass the associated costs.

5 Additional Resources

Additional documentation is available, detailing all three methods of labeling integration. As any detailed documentation of these processes largely depends on the individual solution, the examples and workflows in this level of documentation is based on NiceLabel products and the methodology of their approach to professional label printing and integration. The documents are available at **http://www.nicelabel.com/Learning-center.**

Non-programming Integration (middleware):	▪ White Paper: Non-programming Integration of Label Printing with NiceLabel
Programming Integration:	▪ White Paper: Programming Integration of Label Printing with NiceLabel
Exporting Labels:	▪ White Paper: Integrating Standalone Label Printing with NiceLabel
	▪ White Paper: Printing labels to thermal printers from SAP R/3