Technical Note
Using Artificial Intelligence Rules to Prevent Barcode Labeling Mistakes

The Problem

An increasingly important part of making products is to ensure that the product packaging and shipping containers have the correct barcode labels to meet customer requirements. Failure to do so can result in your customer rejecting the shipment or imposing financial penalties.

It used to be that all you had to do was to create a product label with at most a UPC barcode label and put the products in a shipping box with a shipping label with the customer's address on the outside. In many cases, the UPC label could be preprinted and the shipping label could be printed using your UPS or FedEx shipping system.

Today, each customer wants the products you ship to them, and their packaging, labeled according to the special needs of each customer. This is often accompanied by a requirement to send Advanced Shipment Notice (ASN) data, referring the barcode data on the labels, by EDI or other means to facilitate the customer receiving the shipments.

This is a result of ever closer supply chain integration and the need for supply chain traceability. As a result, we are seeing requirements for each item to have its own unique label, containing data such as the Global Supply Chain One (GS1) standard GTIN (global trade identification number), its serial number, lot number and expiration date. This requires that each label be printed individually and precludes preprinting identical labels for attachment to each item.

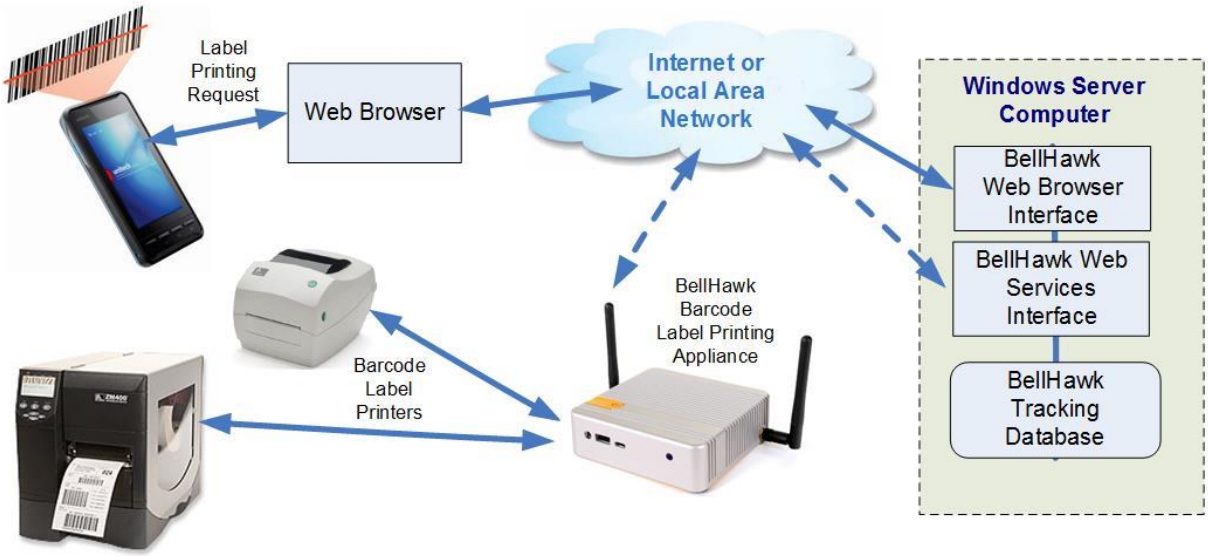
Then each level of packaging has to have its own GS1 SSCC (Serialized Shipping Container Code) barcode along with customer required barcodes and human readable information.

For contract and make-to-order manufacturers, the labels for each customer have to be different, according to the specifications of each customer, to make it easy to integrate into their supply chains, without relabeling the products at the time of receipt.

Many organizations are still preparing their barcode labels by manually typing data into a barcode label layout program and then printing out the resultant labels, either for manual application or application using an automated applicator. This is time consuming and very error prone and is also difficult to integrate with ASN or other data that has to be sent to each customer.

In this technical note we describe how BellHawk Online solves this problem using a combination of Artificial Intelligence and automation of label generation.

The Solution



When a request to print a barcode label is received through the BellHawk Online web browser interface, a set of user defined rules is invoked to select the correct label. These rules are based on factors, such as:

- The product being labeled
- The customer and customer address
- The type of container the product is being placed in

The software in the BellHawk Online then uses these rules to select the correct label and printer. It also uses these rules to automatically retrieve the data needed to be printed on the label and places this data in a print queue on the server. This includes keeping track of serial numbers and automatically issuing unique serial numbers, as needed.

Software in an IIOT (Industrial Internet of Things) appliance is continuously monitoring the print queue in the server (using a technique known as long-polling over the Internet to minimize network load). When it sees a request to print a label of a barcode printer in its facility, it picks up the request, calls up the stored label format, from its local memory, populates the label with data and prints it out on the selected printer.

This eliminates the need for a user to manually select a label format, type in the needed data, and print it out on the selected printer. As a result, time is saved and mistakes are prevented.

Also, as the data to go on the labels is generated electronically, this same data can be saved for automatically relaying to customers as part of ASNs or other supply chain data, which saves time and prevents more mistakes.

Commentary

Setting up the rules is done using Excel spreadsheets, which are imported into BellHawk Online through its web-browser interface, typically using a PC. This can be time consuming, but only

has to be done once for each customer and product combination, typically in conjunction with creating the label format using a label layout software tool. Thereafter all that a production worker has to do is to select a button on the screen of their data entry device and the correct label will be printed out in the correct format, on the correct printer, thereby preventing mistakes.

Not only does this prevent mistakes but it also prevents chaos at the customer site, when the labels on the received products are wrong and/or do not correspond to the advanced shipment notice data.

