Scientific
Research

Practice of Imposition and Illustrator Variable Data Plate Making with Barcode

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Abstract: Variable data printing also called print on demand. There are lots of commercial variable-data-plate making software on the market, those provide adequate function for variable data plate preparing in production, but most of them are either too expensive or binding to an special kind of digital printing machine.

For small printing and packaging company ,they did not have enough money to buy those ,but they all have Adobe Illustrator .Through using Adobe acrobat and Illustrator and open source database management system , you can generate variable data with barcode and layout them in a larger piece of paper.

This article is mainly about how to prepare variable data printing plate and the pros and cons of this method.

Keywords: Variable Data printing;barcode;Illustrator;SQL;imposition

There is a kind of printing business in modern quick printing market---variable data printing; generally we call it personalized printing or print on demand. Because the variable data are based on database technology, and each page is different from others, the processes of design and production rules are much different from traditional pre-press design process. In this kind of working flow the printing plate we need is pure digital, many productions are only printed once, therefore we mostly use ink jet printer to produce these files, if we use traditional method to produce the digital plate we will spend too much time on this cumbersome process. Variable data printing are used mostly in the following area: card, receipt printing etc, which require very short of time to prepare digital plate.[1]

1. Barcode

A barcode is an optical machine-readable representation of data, which shows certain data on certain products. Barcodes can be read by optical scanners called barcode readers, or scanned from an image by special software.[2] Almost every practical management workflow needs barcode and database to manage massive information; printer should make these data show present quickly and accurately for visual communication.

Barcode Writer in Pure Postscript is an award-winning open source barcode maker that facilitates the printing of all major barcode symbologies entirely within level 2 PostScript, ideal for variable data printing[3].The project generates all of the major types of one-dimensional and two-dimensional barcodes supported by the vast majority of barcode scanners, including: EAN-13, EAN-8, ISBN-13, Code 128, Code 39 Extended, Code 93 Extended, PDF417 etc[3].

2. PDF Barcode Batch Generation

After carefully reading the manual of barcode writer of pure postscript, we know it is fairly simple to make barcode through command line interface which also means we can automate the process of barcode creating .The anticipated use of the code is to include the procedural definitions for the relevant encoder and renderer within the prologue of your own PostScript documents.[3]

The postscript functions defined in the barcode.ps file(8526 lines at present),we can use following file 123.txt(here use number to represent barcode number) to call those function.

```
00000001 /Helvetica findfont 10 scalefont setfont
00000002 30 700 moveto (123) (includetext guard-
whitespace) /code39 /uk.co.terryburton.bwipp findre-
source exec
00000003 0 -17 rmoveto (Code 39) show
00000004 showpage
```

We can use operating system command copy to combine barcode.ps and 123.txt(copy barcode.ps+123.txt 123.ps).Because this process is an repeatedly cumbersome process ,so we can employee scripting language to facility it, In this article we choose Windows Script Host (WSH) .WSH is a script host, which is a program that provides an environment in which users can execute scripts in a variety of languages, languages that use a variety of object models to perform tasks.WSH can COM(Component Object Model) objects to carry out system administration tasks, WSH has the ability to run command-line tools.[4]

VBScript is more appropriate to do it automatically as the flowing batch files shows, line 6-10 splitting the barcode string to insert an number (which is the barcode number), line 13 concatenating strings, line 17 produce a new batch file line to connect two postscript files. You can proof it using Adobe acrobat distiller as in figure 1.

```
00000001 REM vbs,generate postscript files，definded
in file <barcode.ps>
00000002 REM generate tops.bat，the user definded
```

barcode part.

```
00000003
00000004        Set      fso      =      CreateOb-
ject("Scripting.FileSystemObject")
00000005 Set f2 = fso.CreateTextFile("c:\tops.bat", True)
00000006 a="/Helvetica findfont 10 scalefont set-
font"+vbCRLF
00000007 b="30 700 moveto ("
00000008 c=") (includetext guardwhitespace) /code39
/uk.co.terryburton.bwipp findresource exec "+vbCRLF
  00000009 d="0 -17 rmoveto (Code 39) show"+vbCRLF
00000010 e="showpage"+vbCRLF
00000011
00000012 for i=123 to 133
00000013 x=a+b+cstr(i)+c+d+e
00000014 Set f1 = fso.CreateTextFile("c:\"+cstr(i)+".txt",
True)
00000015    f1.Write (x)
00000016    f1.Close
00000017    f2.write("copy barcode.ps+"+cstr(i)+".txt" +
space(3)+"d:\temp\"+cstr(i)+".ps"+vbCRLF)
00000018 next
00000019
00000020 f2.close
00000021 msgbox "tops.bat is complete,please distiller it
to pdf"
```

3. Illustrator Variable Data Producing Steps and It's Xml File Structure

The general steps of produce an illustrator variable data plate are:

1)using illustrator to design an template.
2)create dynamic parts of variable data.
3)export data into xml files.
4)select data from database into an text file, which is formatted in illustrator's xml format.
5)combine an well structured variable.xml file.
6)load variable data from the variable.xml file
7)save each dynamic dataset page of illustrator's design to separate PDF files
8)combine separate PDF files into one single PDF file
9)imposing PDF with N-up pages or other booklet styles.

   Below is the analysis of how the file variable.xml is made up.In this example, line1-9 is file header, describe the xml header, providing information for adobe Illustrator to recognize its own xml format with fixed format, we can name it as head.xml;line 10-16 are definition of variable data and dataset, we call it def.xml;line17-21 is the first dataset, line 22-26 is the second dataset, these two parts can be named as data.xml;line 27-30 we call it tail.xml,this part's function are only to make the xml well structured. What we need to concerned mostly is data.xml,the other three are automatically generated by Adobe Illustrator.

```
00000001 <?xml version="1.0" encoding="utf-8"?>
00000002 <!DOCTYPE svg PUBLIC "-//W3C//DTD
SVG 20001102//EN"
"http://www.w3.org/TR/2000/CR-SVG-
20001102/DTD/svg-20001102.dtd" [
00000003    <!ENTITY ns_graphs
"http://ns.adobe.com/Graphs/1.0/">
00000004    <!ENTITY ns_vars
"http://ns.adobe.com/Variables/1.0/">
00000005    <!ENTITY ns_imrep
"http://ns.adobe.com/ImageReplacement/1.0/">
00000006    <!ENTITY ns_custom
"http://ns.adobe.com/GenericCustomNamespace/1.0/">
00000007    <!ENTITY ns_flows
"http://ns.adobe.com/Flows/1.0/">
00000008 <!ENTITY ns_extend
"http://ns.adobe.com/Extensibility/1.0/">
00000009 ]>
00000010 <svg>
00000011 <variableSets xmlns="&ns_vars;">
00000012    <variableSet locked="none" varSet-
Name="binding1">
00000013        <variables>
00000014            <variable var-
Name="v1" trait="textcontent" cate-
gory="http://ns.adobe.com/Flows/1.0/"></variable>
00000015        </variables>
00000016        <v:sampleDataSets
xmlns:v="http://ns.adobe.com/Variables/1.0/"
xmlns="http://ns.adobe.com/GenericCustomNamespace/
1.0/">
00000017            <v:sampleDataSet
dataSetName="dataset 1">
00000018                <v1>
00000019
   <p>11</p>
00000020                </v1>
00000021            </v:sampleDataSet>
00000022            <v:sampleDataSet
dataSetName="dataset 2">
00000023                <v1>
00000024
   <p>22</p>
00000025                </v1>
00000026            </v:sampleDataSet>
00000027        </v:sampleDataSets>
00000028    </variableSet>
00000029 </variableSets>
00000030 </svg>
```

The dataset in the upper data.xml file has basic format ,the more variable we create the more row needed to accommodate data, cause the much longer list of file. These illustrator automated the process of generating the skeleton of xml , allow us to make good use of it. In one dataset we can include many variable parts.

4. Drilling Data Xml Files from Database

Suppose we have the following data in table 1 with 3 rows of data, it has 4 fields:id,name,sex,and barcode to record an human's information, we can manage these data in database management system like Microsoft SQL server(or other open source database, such as mysql, postgresql),

Table 1. Testing Data in Database

id	name	sex	barcode
123	bill	male	123.pdf
124	Nancy	female	124.pdf
125	neo	male	125.pdf

Here we use MS SQL server to store these data, we can get data from the server through programming or query.(If necessary you could even write an stored procedure and save it in the database for repeatedly calling .) the query result as text file:

select '<v:sampleDataSet dataSet-Name="dataset'+convert(varchar(5),id)+'"><v1><p>' +convert(varchar(5),id)+'</p></v1><v2><p>'+conve rt(varchar(5),name)+'</p></v2><v3>'+convert(varch ar(5),SEX)

+'</p><V3><V4>file:///d:/temp'+convert(varchar(10), barcode)+'</v4></v:sampleDataSet>' from userdata；

The query above concatenating strings ,after we got the result file simply trim the first 2 lines and the last 3 lines you will get an well formed xml file. Then we use batch command to combine the head.xml, def.xml, data.xml, tail.xml into one single file, name it as variable.xml.

5. Automating the PDF Storage and Imposition

After data is loaded by illustrator, we can navigate through each dataset and save each page as an PDF file.It would be unbearable without automation or scripting. So we can use the following script to avoid us from thousand times's mouse clicking.The computer is more good at do these repeatedly work!

```
00000001 Set appRef = CreateOb-
         ject("Illustrator.Application")
```

```
00000002 Set docRef = appRef.Documents(1)
00000003 For i = 1 To docRef.DataSets.Count
00000004     myPath =  "d:\1\" & i & ".pdf"
00000005             docRef.DataSets(i).Display
00000006             docRef.SaveAs (myPath)
00000007             Next
00000008 msgbox("ok")
```

Although we can design an new dynamic template for the second time using the above method and those PDF pages and it's names as data source for imposition, using Quite Imposing Plus as an PDF imposition solution is more convinent.To use this workflow, we should first combine those single page PDF documents into one unite PDF file. Then in Adobe Acrobat, we choose Quite Imposing's N-up pages method to automate the PDF layout process.N-up is shorthand for 2-up, 3-up etc, that is, combining more than one different page together on the same sheet.[5]Now we got PDF page ,check it carefully then we can print it out.

6. Conclusion

What we practiced here shows it's not difficult to use illustrator to generate variable data xml files, by doing so it will provide you great efficiency and flexibility, and dramatically reduce your time for plate preparing. For small company without professional variable data making software equipmented,they can also enter this area with common inkjet printer, this offer them opportunity to try to provide value-adding service to their customers and save the designer from tedious dirty working .

Reference

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