Integrating Variable Data Printing in the
Career and Technical Education Classroom

Edward J. Lazaros

Ball State University

ejlazaros@bsu.edu

Abstract

Variable Data Printing (VDP) is transforming the field of graphic communications, and therefore career and technical educators and technology educators should become aware of it. The purpose of this article is to inform educators about the definition and development of VDP, rewards and potential drawbacks of VDP, the need to teach about VDP, the popularity of VDP, and examples of how it is currently being used. Once educators have an understanding of this technology, decisions regarding implementing it in the curriculum can be considered. While it may not be economically feasible for some school districts to invest in VDP, educators should learn more about VDP so that they can collect samples of items that have been printed with VDP. These samples can be shared with students to increase awareness of this advancing technology.

Introduction

Variable Data Printing allows a printer to produce personalized content on a printed piece. One such example that most educators could collect and share with their students is a phone bill. A phone bill is printed with VDP and includes unique information such as the consumers name, address, bill cycle, account number, minutes used, data used, and the bill. **See Figure 1** for an example of a phone bill that was printed with VDP.

Figure 1
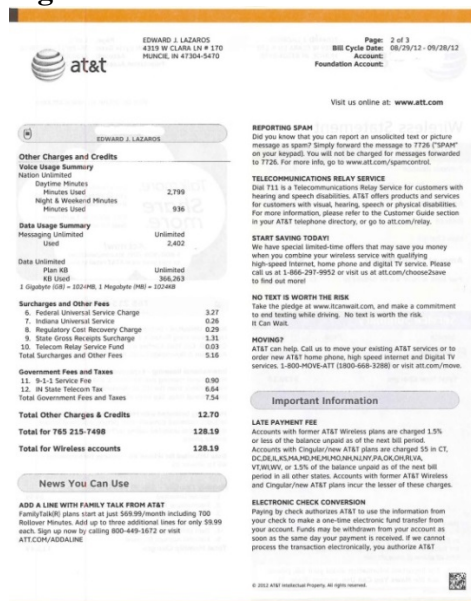
VDP affects the lives of countless consumers without them even knowing that the technology existed. Indiana Ticket Company in Muncie, Indiana uses VDP technology and produces tickets with individualized ticket numbering. **See Figure 2** for an example of tickets that have received individualized numbering. Educators could collect samples of tickets from professional sporting events and share these with students during discussions about how VDP technology works. According to Alexander (2004), "variable-data printing involves the creation of an initial, unfinished document (the template) to which variable information (text or images) can be added at specific locations to create finished, print ready documents in more than one version" (p. 3). According to Bennett, Levenson, & Romano (2006), "VDP is simply the ability to vary data from page to page" (p. 3). VDP makes it possible to print content that is unique and relevant to each individual. Unlike typical mass mail marketing, VDP has the potential to reduce the volume of mail produced by direct mail marketing. With rising costs in shipping and postal rates, this new technology becomes an attractive option for modern print providers. Educators need to immerse themselves in the development, use, and integration techniques for VDP in the classroom.

Figure 2

VDP Development

The development of VDP has been a long process. In a primitive form, VDP has been around for many years. With the introduction of personal computers in the early 1980s, Microsoft Office provided the function of mail merge. This allowed printing a client's name over a traditionally printed piece (Bennett, et al., 2006, p. 3). VDP came into being in the early 1990s with the rise of printers such as Xeikon, Indigo, NexPress, and Xerox. Most of these printers were limited to monochrome dot-matrix products. Throughout the 1990's, developers continued providing higher- and higher-quality color laser printing. Cheaper color printing has increased the use of VDP (Wolfe, 2003, p. 14).

One of the challenges of VDP relates to file size. Since every page in a typical VDP document is unique, VDP documents can contain hundreds or thousands of pages, depending on the size of the job. This leads to the problem of potentially huge file sizes, which can slow down a printer's workflow. One of the keys to solving this problem has

been file formats developed specifically to reuse common objects. For example, a VDP job may have 2,000 unique pages, but all of the pages share the same images. File formats have been developed that can reuse those common images, thus reducing the overall size of the file drastically. However, there are numerous file formats or "languages" currently in use for VDP, which makes the digital world of VDP a very complex one (Harper, 2007, p. 1-2).

In 1999, developers started a commission to establish standard specifications for variable data printing. The PODI (Print on Demand Initiative) designed PPML (Personalized Print Markup Language). PPML, based on XML (Extensible Markup Language), was initially too restrictive. Another commission shifted PPML's focus to PDF printing (Alexander, 2004, p. 24). The present forms of PPML are PPML/VDX and PPML/GA. VDX (Variable Data Exchange) is designed for projects without a known printing system. GA (Graphic Arts), on the other hand, is very similar to the proprietary versions of PPML. PPML/GA has a wider adoption rate among many printing companies. Although its growth has been slow and steady, VDP continues to secure a niche for itself in the digital printing market.

Using a Database
The heart of the VDP process is a robust database. **See Figure 3** for an example of what a robust database looks like.

Figure 3

Once data is obtained for use in a database, it must be used wisely to be effective. Kate Dunn, the president and owner of Digital Innovations Group, says:

> For example, you might buy a list that tells you whether someone is married or
> single. However, you are not going to send out a piece that says, "John, you're
> single, so you might be interested in this…" Instead, you'll say, this group is all
> single people, so we will use this picture and this messaging. This group is all
> married people, so we will use that picture and that messaging." Married or single
> is what the database says. You have to extrapolate how you want to use data for
> marketing (Tolliver-Nigro, 2010, p. 12).

Information held within a database, such as a client's name and address, is easily
assigned to individual printed pieces. Current changes in software and the advancements
in digital printing have allowed extensive options with variable data. Options extend well
beyond the transitional monochrome designs to full color. According to Alexander
(2004), "Several of the categories that had been predominantly monochrome (or
monochrome with a single spot color) are now starting to see demand for color" (p. 4).

Available VDP Software
A variety of different VDP products are currently on the market. These include:
*   EZ-Letter (ABA, Inc., www.accessaba.com). EZ-Letter is used to generate labels
    for direct mail.
*   FormScape (Bottomline Technologies, www.bottomline.com). FormScape is
    used for generating reports, invoices, and labels
*   Bdoc Suite (Business Documents, www.bdoc.com). Bdoc Suite is used to create
    long and complex documents like insurance policies.
*   Darwin Desktop (Creo Color Servers, www.creo.com). Darwin Desktop is used to
    create very long documents such as personalized catalogs.
*   HP Exstream (HP, www.hp.com). HP Exstream generates marketing materials
    and business documents such as statements.
*   XMPie (Xerox, www.xmpie.com). XMPie, like Darwin, is a sophisticated VDP
    software that allows for extensive personalization of text, design, and images
    (Alexander, 2004).

Tough Transition to VDP
The rewards of VDP and digital print are evident; however, as a concept, VDP has been
difficult to sell to the printing industry. Many printers have indicated that the concept is
too new to grasp, there is not enough data to support the extensive VDP options, and
digital printing equipment can be expensive. There are also confidentiality concerns, and
not enough time to learn or implement the VDP process (Farquharson, 2007, p. 36).

The transition from the analog print and the traditional mail marketing is not easy.
Careful planning is required to make this a smooth transition. The individual steps within
the graphic communication workflow require a reevaluation when working with variable
data. However, through these challenges come opportunities for individuals and
organizations. The challenge is to harness this potential and provide variations in print
that are beneficial to the print buyer. To be able to utilize the functions of VDP, the
graphic communications firm must have access to information that relates to clients they

intend to target. **See Figure 4** which illustrates how information about clients on the right screen is used when assigning tickets for a sporting event on the left screen.

Figure 4

Those in the graphics industry should make sure there is a need for VDP services prior to making the investment. Farquharson (2007) encourages printers to communicate with their customers to determine their needs related to VDP output. If the customers express considerable interest, there may be enough demand to make the investment in this new technology. Printing variable data jobs has become easier than ever before. **See Figure 5** for an example of a modern press being used to print a variable data job. Web-based clients currently provide intuitive systems for designing custom templates. Businesses can offer free PDF previews of a customer's project before providing a quote. Many have enabled one-click ordering systems (Felici & Alexander, 2004). Support for XML and other data formats are increasing in prominence.

Figure 5.

The popularity and feasibility of VDP seems poised to continue to advance. According to Romano (2004), "We expect that more complex jobs will call for intermediation by the printer, who will generate new profits through database and related services" (p. 22). Some analysts have contemplated the pros and cons of a company simply printing its own advertisements, rather than approaching a firm. "…Variable data tools and digital printers are becoming so easy to use that a business can create its own professional-looking variable data print jobs in pursuit of an internal corporate goal" (Lenatti, 2008, pg. 14).

Examples of VDP Systems

Political campaigns are experimenting with independent VDP. VDP is perfect for customized mass-mailers. To test this, one Democratic campaign group purchased their own printers, and produced between 400,000 and 500,000 mailers a day for a small local campaign (D'Aprile, 2009, p. 14). With these personalized mailers came a tenfold surge in response rates. This surge came at a cost; the price for a single traditionally-printed mailer hovers around ten cents. The price for a VDP mailer is around four dollars (D'Aprile, 2009, p.15).

Although all types of VDP systems on the market share the concept of a template where content can be added, their implementation varies. Transaction printing is among those that use a page layout approach to determine where boundaries for information will be. The software has rules for determining where page boundaries should be positioned and for how long a document should be. Typically, billing documents are unpredictable in terms of length, so a page layout approach would not be feasible and software with rules for determining page boundaries would be more appropriate (Alexander, 2004, p. 5). Due to this, invoices and bills are often generated using a VDP process.

Other examples of easily-ignored products that have the potential to be more successful with VDP include direct mail messages indicating that you may have "already won." While these systems have been the mainstay for many years, their lack of color has easily identified them as junk mail, thus providing the client with limited success. Savvy businesses are putting pressure on print providers for improved appearance and quality. **See Figure 6** which illustrates an individual checking the quality of color for a print job to guarantee outstanding appearance and quality. Businesses are demanding better designs, more color, and a higher return on their investment. Fortunately, digital color printing is becoming more economical and practical for large print jobs (Alexander, 2004, p. 3).

Figure 6

Large firms with enough capital have caught on to the VDP revolution as well. General Motors experimented with VDP by mailing three million personalized advertisements. A New York university mailed several thousand custom mailers to prospective students, advertising many sports and activities specifically selected for the recipient. Basic information is often contained in a customer database; from that information, more detailed information can be extrapolated (Lenatti, 2008, pg. 15). Data used in these campaigns was largely drawn from Internet sources. Although the cost of data management, printing, and prepress are still high, firms argue overall marketing costs are lessened by VDP (Schmidt, 2000, p.13). Rather than sending out a vast quantity of anonymous mailers, companies can send out smaller quantities of personalized mailers and hopefully receive a greater return on investment.

Conclusion
It remains to be seen whether or not VDP will become common in political campaigns and businesses, but its growing presence is undeniable. The field of graphic communications is going to continue to evolve as VDP transforms printed products. With such a wide variety of applications, educators should be aware of this evolution and begin to teach students about VDP and its future potential in the industry. Educators should consider gathering VDP printed samples to share with students and working toward the procurement and integration of VDP technology in career and technical education and technology education classrooms and laboratories if economically feasible.

References
Alexander, G. (2004). The shifting market for variable-data printing software. Seybold Report: Analyzing Publishing Technologies, 4(5), 3-12, 22-23.

Bennett, P., Levenson, H., Romano, F. (2006). The handbook for digital printing and variable-data printing. Pittsburgh, PA: PIA / GATF Press.

D'Aprile S. (2009).The Coming Variable Print Revolution. Politics (Campaigns & Elections), 282, 14-16.

Farquharson, B. (2007). Variable print, variable success. Graphic Arts Monthly, 35-37.

Felici, J., & Alexander, G. (2004). Variable Data and Personalization: The Evolution Continues. Seybold Report: Analyzing Publishing Technologies, 4(7), 6-11.

Harper, E. (2007). Speaking In Tongues: Sorting Out Variable Data Printing Languages. Seybold Report: Analyzing Publishing Technologies, 7(17), 1-6.

Lenatti, C. (2008). Digital Print is Growing, but is it Good for Printers? Seybold Report: Analyzing Publishing Technologies, 8(4), 14-16.

Romano, F. (2004). Printing redefined. Seybold report: Analyzing Publishing Technologies, 4(19), 21-23.

Schmidt, K.F. (2000). Printing for One. Print, 54(3), 139.

Tolliver-Nigro, H. (2010). Variable Data Gurus Discuss Techniques for One-to-One Campaigns. Seybold Report: Analyzing Publishing Technologies, 10(15), 9-13.

Wolfe, K. (2003). Ten Years Along: Assessing the Digital Printing Invasion. Seybold Report: Analyzing Publishing Technologies, 3(9)10-14.