Variable-data printing (VDP) (also known as **variable-information printing (VIP)** or VI) is a form of on-demand printing in which elements such as text, graphics and images may be changed from one printed piece to the next, without stopping or slowing down the printing process and using information from a database or external file. For example, a set of personalized letters, each with the same basic layout, can be printed with a different name and address on each letter. Variable data printing is mainly used for direct marketing, customer relationship management, advertising and invoicing on selfmailers, brochures or postcard campaigns.

The technique is a direct outgrowth of digital printing, which harnesses computer databases and digital print devices and highly effective software to create high-quality, full color documents, with a look and feel comparable to conventional offset printing.

Variable data printing enables the mass customization of documents via digital print technology, as opposed to the 'mass-production' of a single document using offset lithography. Instead of producing 10,000 copies of a single document, delivering a single message to 10,000 customers, variable data printing could print 10,000 unique documents with customized messages for each customer.

There are two main operational modes to VDP. In one methodology, the document template and the variable information are both sent to Raster Image Processor (RIP) which combines the two to produce each unique document. The other methodology is to combine the static and variable elements prior to printing, using specialized VDP software applications. These applications produce an optimized print stream, such as PostScript and PPML, which organize the print stream efficiently so that the static elements are only processed once by the RIP.

There are several levels of variable printing. The most basic level involves changing the salutation or name on each copy. More complicated variable data printing uses 'versioning', where there may be differing amounts of customization for different markets, with text and images changing for groups of addresses based upon which segment of the market is being addressed. Finally there is full variability printing, where the text and images can be altered for each individual address. All three types of variable data printing begin with a basic design that indicates which sections can be altered and a database of information that fills in the changeable fields. Since 2005, the term TransPromo or transpromotional has emerged to cover the merging of promotional content and transactional print pieces by involving more business users in the printing process.

The returns for variable printing vary from double the normal return at the basic level to 10-15 times the return for fully variable jobs. This naturally depends on content and the relevancy of that content, but the technique presents an effective tool for increasing ROI (return on investment) on marketing campaigns.

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