

## **Digital Data Exchange Standards (DDES) -- Its Role in Electronically Integrated Publishing**

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### **Abstract**

In order for the graphic arts industry to achieve true electronically integrated publishing (EIP) the bits and bytes that are used in design and production must become transportable across a variety of systems and a variety of design/production environments. This is the goal of the Digital Data Exchange Standards (DDES) development efforts. This body of work, the development of which began in 1985, is now complete through its first generation. These American National Standards (ANS) are known as ANS IT8.1 through IT8.5. They provide a common mechanism for the exchange of digital data across a variety of systems. This paper presents information on the new directions that are being taken in the standardization arena at both the national and international levels.

### **EIP Requirements for DDES**

There are a variety of technical issues involved with accomplishing true electronically integrated publishing (EIP) within the graphic arts industry. However, one of the most important deals with the development of standards that will assist the free flow of data across our various market segments and various systems.

In this respect EIP is not really a new topic for our industry. In many ways much of the thinking behind this concept has evolved out of technical issues such as computer-to-plate.

What are new are the strides that our industry is making towards reaching the goal of true EIP. Today we have many of the basic components and systems required to make electronically integrated publishing and computer-to-plate possible within a variety of market niches. What we mostly lack, however, is the ability to easily integrate these components and systems into a cohesive design to production to press flow that responds to the requirements of our industry.

In order to achieve true EIP, our industry must have the ability to capture data at the earliest logical point in the process. In many

cases this earliest logical point exists within the creative segment of our industry.

We must also have the ability to maintain the editability of this data through to the last logical point in the process. This is required because our business is one that is heavily involved with making last minute changes.

Obviously this data must be able to be transported across a variety of different businesses within our industry. An important aspect to making all of these necessary transfers is that the data not be eroded in the process.

Throughout all of this we must also have some form of digital color calibration, communication, and control. This is a fundamental requirement of the graphic arts industry.

All of these issues really have to do with the development of sensible technical standards developed by companies who are involved with the graphic arts. It requires the cooperation of a wide variety of vendors and users who are looking toward their future with an understanding that these standards must exist if the graphic arts industry is to truly capitalize on the investment that it has been, and will continue to make, in automating the art, craft, and skill inherent to it.

### **DDES Development**

The first technical paper to address the needs and requirements for DDES was presented at TAGA in 1985.<sup>1</sup> It provided a target for subsequent development and served as a focus mechanism for this important industry issue.

The following autumn at the 1985 *Lasers in Graphics* conference a user/vendor forum was held that further explored the need for DDES development.<sup>2</sup>

In December of that same year a group of vendors formed an ad-hoc standards development group. At this first meeting of the DDES group all of the participating vendors exchanged what had heretofore been their proprietary formats for pictures on tape. These formats served as the baseline data for the subsequent development of what is known today as the ANSI IT8.1 standard.

It is important to point out that in 1985, when the graphic arts industry first began working on developing these standards, there did

not as of yet exist an accredited graphic arts industry standards committee within the American National Standards Institute (ANSI).

There was a graphic arts technology standards body within the International Standards Organization (ISO), however this committee had been dormant for several years.

Thus between 1985 and the early months of 1990 the graphic arts industry has accomplished the following:

1. A graphic arts industry standards committee has been formed under ANSI. This committee is known as ANSI IT8. It is continuing the development of DDES.
2. The first generation of DDES (i.e., ANS IT8.1 through IT8.5) are all fully approved American National Standards (ANS).
3. The graphic arts technology standards committee within ISO (i.e., ISO TC 130) has been reactivated and is handling a variety of projects of interest to the graphic arts industry.
4. ANS IT8.1 through IT8.5 are being forwarded through ISO on the fast track procedure with the goal of becoming international standards.

### **The First Generation of DDES**

What we now refer to as the first generation of DDES is a series of compatible standards that facilitate the exchange of data between a variety of systems.

The following briefly describes what these standards are involved with:

- \* ANS IT8.1 - 1988: This standard defines the transfer of color picture data via a magnetic tape transport using ANSI X3.27 formats. It became an approved American National Standard in 1988.
- \* ANS IT8.2 - 1988: This standard defines the transfer of data-compressed color line work via magnetic tape. It also became an ANS in 1988.
- \* ANS IT8.3 - 1990: This standard defines geometric descriptions for the transfer of vector information via magnetic tape and other transport mechanisms (i.e., floppy disks and other media). It became a standard earlier this year.

\* ANS IT8.4 - 1989: This standard defines an on-line SCSI interface for direct digital color proofing devices. It was approved as a standard in 1989.

\* ANS IT8.5 - 1989: This standard defines extensions of IT8.1 and IT8.2 so they can be used efficiently with monochrome pictures and line work. IT8.5 became a standard in 1989.

### **New Directions for DDES**

Now that the first generation of DDES is complete the ANSI IT8 committee is taking several new directions to develop additional standards that meet the needs of the graphic arts industry.

The scope of the ANSI IT8 committee is "...to develop standard data formats to accomplish the exchange of digitally encoded images between digital prepress and image processing systems and their respective components produced by different suppliers of said equipment to the graphic arts industry, in an attempt to better serve the needs of the graphic arts industry's use of said equipment in the design and prepress production of printed materials."

"The work is currently concerned with, but not limited to, the development of formats for the exchange of the following types of image data: 1) color picture data, 2) line art data, 3) geometric placement data. The committee will extend its efforts into the development of standardized formats to facilitate device interfaces of digital color prepress image processing systems as these become logical to standardize." <sup>3</sup>

The IT8 committee has two subcommittees. The first, IT8/SC1, is chartered with accomplishing the technical development work. Seven working groups under this committee do the actual standards development research and writing. In addition, various working parties are assigned to short-term technical tasks and investigations that support the standards development activities.

The IT8 committee has selected three primary areas for continued standards development. These areas are organization (i.e., architecture), content, and transport. The secondary areas under which standards development will continue are application profiles and external interfaces.

The new working groups under ANSI IT8/SC1 are:

\*IT8/SC1/WG1: Working Group 1 is responsible for issues regarding page description. Its main priority is the development of methodology to transfer all of the page contents with sufficient information for a receiving system to construct the intended image for print.

\*IT8/SC1/WG2: Working Group 2 is responsible for issues in the areas of the content to be used to construct pages. Its priorities are to establish a standard YMCK, to establish physical and digital colorimetric reference targets, and to define a means of specifying palette color.

\*IT8/SC1/WG3: Working Group 3 is responsible for transport (i.e., interfacing issues), and has priorities of establishing a generalized SCSI (e.g., the standard use of erasable optical disks), and the use of networks including FDDI.

Working groups four through ten are reserved for future development projects pertaining to the primary areas of the ANSI IT8 committee's standards developments.

\*IT8/SC1/WG11: Working Group 11 has been formed to pursue color communication and control. In the development area it is focusing its efforts on RGB standards, YMCK standards, color transforms, and standard targets for scanning. In the standards area, it is working on digital targets for recording and multi-vendor system calibration.

\*IT8/SC1/WG12: Working Group 12 is developing a method for exchanging information on assembling and organizing the content of a page into the composite desired for output. It is also concerned with the issues involved in accepting data from standard and de-facto PDL specifications.

\*IT8/SC1/WG13: Working Group 13 is investigating interfaces-to-content descriptions such as TIFF, OPI and encapsulated PostScript, and the possibility of standardizing de-facto content descriptions.

\*IT8/SC1/WG14: Working Group 14 is chartered with the responsibility of developing on-line interfaces between color electronic prepress systems (CEPS), and between CEPS and color scanners.

The other subcommittee under IT8 (i.e. IT8/SC2) is responsible for liaison with other standards-making bodies and with the graphic arts industry. This committee also maintains the documentation of the

standards and the work of the various committees. It serves as the public relations arm of the IT8 committee and provides other related administrative support.

### **International Standards Developments**

With the reactivation of ISO's committee for graphics technology (i.e., ISO TC130) a variety of projects are also underway concerning standards development at the international level.

There are five working groups under the ISO TC 130 committee. Working Group 1 (ISO TC 130/WG1) on terminology is in the process of developing a multilingual terminology of printing and graphic arts using a central electronic database.

Working Group 2 (ISO TC 130/WG2) is chartered with developing standards in the area of prepress. Its first area of activity concerns the creation of a graphic arts electronic data exchange interface that will be organized by the sections of content, data organization, and transportation. A high priority for this work is being given to the development of on-line interfaces. This work is currently concerned with, but not limited to, color picture data, line art data, and geometric placement data. Working Group 2 is expected to extend this effort into the development of standardized formats to facilitate device interfaces of digital color prepress image processing systems.

This working group is also working on the selection of a reference set of digitally encoded natural and synthetic images to control the level of image quality of electronic page makeup, proofing, and data compression systems.

Another work item on Working Group 2's agenda is the development of a methodology for using the defined RGB, YMCK, CIE LAB, and CIE XYZ color spaces to exchange color data. This methodology will be consistent, where practical, with the office document architecture (ODA) specification.

The development of a methodology for assembling and organizing content data into composite images for output has also been assigned to WG2. This effort will use existing content definitions as defined in prepress/design data exchange and will identify any new content information that may be required.

Deriving a multipurpose on-line interface using a data translation concept that allows for input of multiple data formats and outputs multiple data formats is also a new work item for WG2.

Working Group 3 concerns itself with the issues relative to developing standards for prepress process control. Color proofing using video monitors, or soft proofing, will be examined by this working group. The goal of this activity will be to establish parameters for color proofing using VDT color monitors to visually simulate how color data will reproduce on the final production press. WG3 is also developing a series of standardized test methodologies for this area.

Working Group 4 is focused on media and materials, while working group five is examining standards for ergonomics and safety.

### **Footnotes**

1. "The Issue of Standards for Electronic Prepress", Patrice M. Wagner and S. Thomas Dunn, 1985 TAGA Conference Proceedings, published by the Technical Association of the Graphic Arts (TAGA), pp. 88 - 95.
2. "Digital Data Exchange", Patrice M. Wagner, S. Thomas Dunn, James Hitchman, Murray Oles, et. al., 1985 Lasers in Graphics Conference Proceedings, Published by DTI, Vol. I, pp. 32 - 75-5.
3. "ANSI IT8 Scope Statement", as on file with the American National Standards Institute (ANSI).