

Digital Data Exchange Standards (DDES) for Graphic Arts - An Update on Technical Development

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Abstract: The following is a summary of the status of the DDES project, as of March 2, 1989. The DDES project has been presented at each TAGA meeting since 1985. The project began at The Laser in Graphics conference in 1985 and held its first vendor meeting on December 10, 1985 in Gatlinburg, Tennessee. Since then the project has grown and progressed with NPES sponsorship and ANSI accreditation in 1987 and the first standard (IT8.1) on July 5, 1988.

Since its inception DDES has had a main goal to establish the kernal of standards activities within graphic arts. It has progressed step by step: First by addressing current requirements for data exchange between CEPS via magnetic tape and then progressing to online interfaces (IT8.4). Now the organization is broadening its thinking and looking towards the future, as well as more cooperation within the standard community.

I. History and Current Status

To review the history and current status, we first state the scope of IT8.

"The scope of this activity is to develop standard data formats to accomplish the exchange of digitally encoded images between digital prepress image processing systems and their respective components produced by different suppliers of said equipment to the graphic arts industries, 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."

With this scope, and the work accomplished prior to ANSI accreditation of DDES, the following projects have been begun and/or completed.

- A) **IT8.1:** This effort was to define the transfer of color pictures via a magnetic tape. This became an approved ANSI standard on July 5, 1988.
- B) **IT8.2:** This effort was to define the transfer of colored line work via magnetic tape and this became an ANSI standard in December 14, 1988.
- C) **IT8.3:** This effort is to define geometric descriptions for transfer of vector information via magnetic tape and other transport mechanisms. The magnetic tape version is being prepared for public review at the ANSI level. The other transport media version is currently in the drafting stage.
- D) **IT8.4:** This effort is to define an on-line SCSI interface between Color Electronic Prepress Systems (CEPS) and Direct Digital Color Proofing devices. The draft has been approved at the VTS level and is being prepared for review by VTS, IT8, and ANSI public review.
- E) **IT8.5:** This effort is to extend IT8.1 and IT8.2 to efficient use for monochrome pictures and line work. The draft has been approved at the VTS level and is being prepared for review by VTS, IT8, and ANSI public review.
- F) **IT8.6** This effort is to prepare a simple standard for communicating die cutting information between prepress systems and die cutters and among die cutting systems from different vendors.
- G) **Other Activities Being Investigated.**

The VTS is investigating other areas of need in two ways:
a) the formation of working parties to access specific needs and
b) a survey which is included in this report.

1. Working Party Investigations

There are five working parties with the following assignments.

- a) **Response to ODA Color Addendum:** This working party has provided a response to ODA Color Addendum that states the

requirements of IT8 to allow the potential for compatibility of color information between the graphic arts and the ODA environment. It is continuing its liaison with this activity.

ODA is the Office Document Architecture (ODA) group within ISO responsible for standardizing the communication of office documents. The ODA Color addendum is intended to provide a means of communicating color.

- b) **Reorganization:** This working party has completed its initial work and proposed a specific reorganization of both VTS and IT8 while maintaining the same scope. This group is now implementing plans for the reorganization of VTS (Shown later in this report) and recommending reorganization of IT8.
- c) **Design Systems:** This working party task is to study the issues in the communications between design and production for print. The scope of this investigation is to include data formats and PDLs in use on the design systems, color descriptions in use, communication transports, required transfers, and recommendations for the direction of further work in this area.
- d) **Colorimetric Reference Sample:** This working party is to investigate the concept of a colorimetric reference sample for use with electronic prepress systems and their components. A preliminary scope is as follows:

Agree to a spatial and colorimetric format for a hard copy color reference sample. The reference sample is intended to be used for color calibration, technical evaluation and reference, throughout the design and prepress market. It may also be useful for printing press applications.

The standard is intended to define the spatial and colorimetric values for the reference sample, and means of determining these values from the reference sample.

Supplier of such reference samples should indicate the tolerance level to which they approach the value of the standard and the anticipated life of the standard reference sample under recommended storage and use conditions.

- e) **Transport Independence:** To date the IT8 work has combined the data (contents) and the transport mechanism. This working party is investigating a simple way to extend the current work to be transport-independent.

f) **SPS Association:** A letter has been sent to the SPS Association to indicate interest in their color task force and their liaison task force. The activity (SPS) has stated objectives to bring higher level of standards to this "de facto" standard. *This association is dealing with issues concerning PostScript.*

2. Other Activities

The VTS continues its liaison activities with a variety of groups in many areas:

- News Wire Photo (IPTC/ANPA)
- Picture Data Compression (JPEG - ISO/IEC/JTC1/SC2/WG8 & CCITT Study Group VIII).
- New Magnetic Media (X3B5).
- SCSI (X3T9.2)
- FDDI (X3T9.5)
- SPS Association
- Formats (X3H3)
- ISO (TC130)

H. International Response

From the beginning IT8 has had a high degree of participation (through their U.S. companies) by vendor members whose technical centers and/or headquarters are outside of the USA. This led to positive progress on the international front.

To date two significant areas of progress are underway in the international scene.

ISO through DIN (German Standards Institute) is interested in reactivating TC130 (Graphics Arts Technical Committee) which has indicated an interest in adopting IT8 (DDES) work.

In support of this, these multi-national efforts are being made to reactivate ISO Technical Committee (TC) 130, Graphic Technology, and to initiate work that would allow the IT8 DDES work to be considered for international standardization. Formal action has been initiated by the US TAG to TC130 as well as a DIN (Germany) group.

In Japan DDES (IT8) standards are being translated into Japan Industrial Standards (JIS).

Thus the international adoption and use of DDES (IT8) is al: moving with good progress.

II. Proposed Reorganization

The proposed reorganization comes in two parts:

- A. Reorganization of VTS structure
- B. Reorganization of IT8 structure

A. Current Organization

First, the current organization of IT8 is given in Figure while the organization of VTS is given in Figure 2.

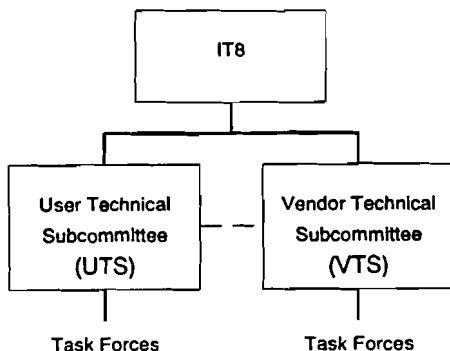
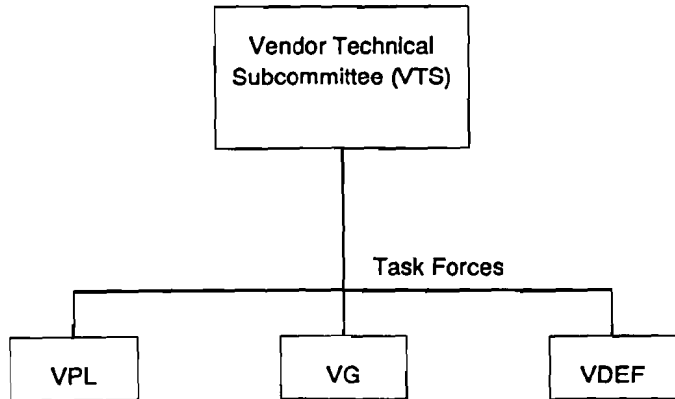


Figure 1: Organization of IT8



VPL: Pictures and line art on magnetic tape (IT8.1, IT8.2, and IT8.5).

VG: Geometric data on magnetic tape (IT8.3) and die-cutters (IT8.6). Also other media for this application.

VDEF: On-line interface using SCSI for direct digital color proofing (IT8.4) using data description from IT8.1, IT8.2, IT8.3 as applicable.

Figure 2: VTS Organization

In addition, several study groups (working parties) have been formed.

B. Reorganization of VTS.

For two years the VTS has struggled with the issues of the best structure for the standards work, as well as the best organization to implement the selected structure for the standards work.

Although the initial direction of tape transfers and on-line DDCP were the correct decisions at the time, these decision are becoming very limiting. To date, the practical development of IT8.1 - IT8.5 has mixed into each standard 1) the description of the data, 2) the means of transporting the data, and 3) the organization of the data. These decisions, although pragmatic at the time, have been under extensive review in order to develop a future standards development path that would be more flexible and useable. One basic ground rule has been and continues to be that IT8.1 - IT8.5 implementations will not be impacted (changed in any way), so that these standards and evolving standards can be implemented now without fear of modification to the basic standards from the beginning phases of DDES/IT8.

During the entire DDES project it has been recognized that at least a 3-dimensional matrix was involved (Figure 3).

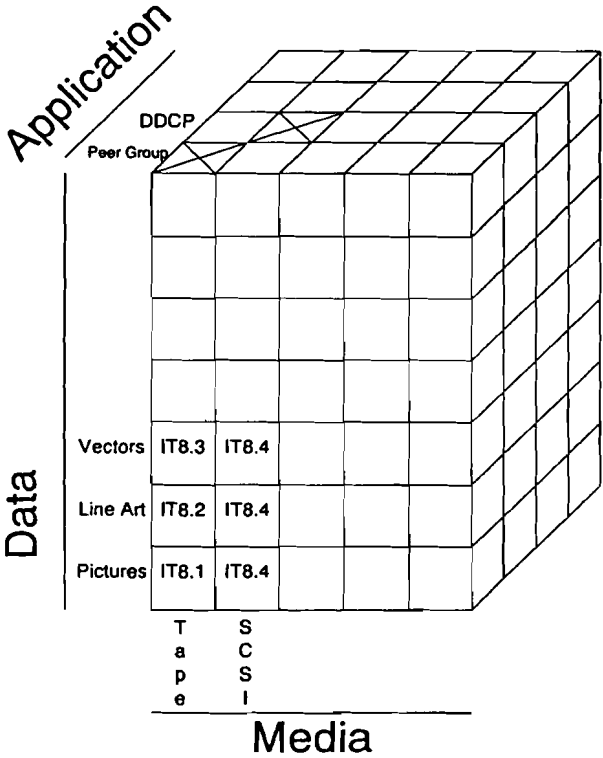


Figure 3: Basic Matrix for DDES.

This matrix, however, doesn't cover the right issues. After some consideration VTS has selected the primary areas for standards as being:

- Organization (Architecture)
- Content
- Transport

and the secondary areas for standards focus being:

- Application (Profiles)
- External Interfaces.

Thus VTS is in the process of transition from the original three task forces to three work groups. That is, the current task forces of

- VPL
- VG
- VDEF

will wind down their activity as their work is completed. At the same time, three work groups will be established along these initial lines.

- WG1: WG1 is responsible for the **organization** (or **Architecture of the content**) into the desired result (page, document, image, . . .). WG1 also includes the issues of editability (**processable, formatted, processable formatted**) and audit trails. Audit trails show the history of a document image, etc. The WG1 is also responsible for the Master Directory (development, maintenance and insured correct usage in all IT8 standards).
- WG2: WG2 is responsible for the **contents** of the desired result (page, document, image . . .) and consists of entities (pictures, linework, geometry, type) and the attributes of these entities. WG2 also includes encoding of the entities. Further WG2 includes job information. This area includes content that is to be printed, as well as non-printed content.
- WG3: WG3 is responsible for selecting defining, and/or specifying the appropriate means of transport and the required packaging of the content and specification of the organization for the transport mechanism to be used.

Thus there would be three permanent working groups.

- WG1: Organization
- WG2: Content
- WG3: Transport

There are two other major areas where working groups or working parties may be formed from time to time.

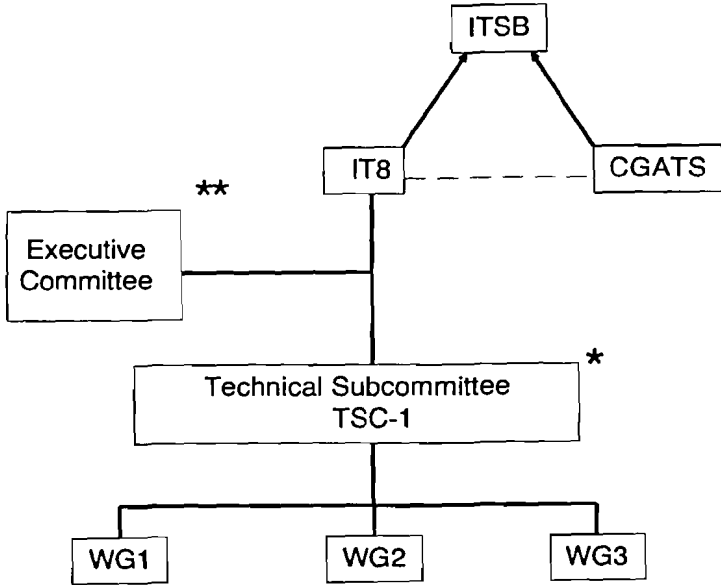
Applications: Applications are specific application profiles that make use of content, organization, and transportation in a unique and specified way for an application or a class of applications. DDCP (IT8.4) is an application profile which uses content description from IT8.1 (pictures), IT8.2 (color line work), and IT8.3 vectors and uses the minimum organizational capability of IT8.3, and the SCSI standard for an online interface between CEPS and DDCP devices.

External Interface: External Interfaces deal with issues of receiving receiving data from or sending data to non-IT8 environments. (This can also cover content, organization, and transport.) External interfaces could be the acceptance of PostScript files from the design environment, or from a Standard Page Description Language (SPDL) environment.

It is believed by the VTS that this basis for re-organization will be the best foundation for future standards development, and is being implemented at the VTS level, within the current scope of VTS and IT8.

C. Recommendations to IT8.

In conjunction with the reorganization of VTS, VTS also proposes to IT8 a re-organization. On several occasions members of IT8 and the UTS have requested a higher level of participation in VTS. Various mechanisms were developed to respond to this task. At this time the VTS would like to recommend that IT8 re-organize, with the same scope, as depicted in Figure 4.



*Membership Fee
 Observer Fee
 Users can be members

** 9 member Executive Committee for long range planning, elected by IT8.

With this reorganization it is assumed that there will be additional TSCs, WGs and Working Parties (WP). It would also bring all the technical work under one subcommittee, and the WGs are as described in the VTS reorganization. The VTS reorganization is proceeding independent of this recommendation. From the VTS viewpoint the executive committee would provide the primary planning resource for IT8 and TSCs. It may also be the case that there are several other areas of responsibility that IT8 may wish to assign to such a group (executive committee). The VTS believes that the reorganization of IT8 in conjunction with the ongoing reorganization of VTS will lead to optimum flow of work as well as the best bases upon which to develop further standards.

The proposed merger of VTS and UTS would lead to voting members, and non-voting observers (each with appropriate fees).