STATUS OF DDES AND RELATED EFFORTS

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Abstract: The standardization of the
interchange of color pictures between color
electronic prepress systems (CEPS) and CEPS
related systems or components, has been
accomplished with the ratification of DDES UEF00.
Now work is nearing completion on three other
fronts with formats for Line Art files, Geometric
Art files, and device exchange standards. These
standards and other standards coordination
efforts, assisted by the formation of the
Committee for Graphic Arts Technical Standards
(CGATS), should help tie the fragmented graphic
arts industry together and improve its overall
productivity.

Standards in the Graphic Arts

Standards and taxes have a lot in common. Like
taxes, everyone agrees standards really are good
for us. But, like taxes, everyone prefers to let
the other guy pay his full share, while minimizing
his or her own contribution. And, like taxes,
everyone has a better, fairer, or easier way to
assure our future than whatever standard is in
question.

As a matter of fact, the word "standard" seems
to imply that there is a better way to achieve a
given objective, because it implies group
consensus, which implies mediocrity. Strange
words from someone who has dedicated himself to
the standards process, yet deplores the concept of
there being anything less than the best as an
acceptable alternative to anything. However, the
benefits which can be realized by creating

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standards do, in fact, create an environment
where the best are allowed to flourish, and
recognition of the risks allows those of us
involved in the process to minimize them.

Standards provide two major functions. First,
they establish a method of benchmarking whatever
the standards apply to. Whether it's a press that
adheres to the ANSI B65 safety standard or a
computer that can write a magnetic tape in a DDES
format, the existence of the standard establishes
a minimum performance level for whatever it is we
are evaluating. Quite often there are a lot of
other things the object we are evaluating does,
but we know as a minimum it does our standard
subset. What this also provides is an
established, recognized, definable terminology
subset or glossary, to describe whatever it is we
set the standard for. Given that there is no
industry I know of with more misunderstood and
randomly defined terms than our industry, it
stands to reason that no one can benefit more from
standards than the graphic arts industry can. I'd
estimate that 50-70% of the effort behind DDES has
involved coming to grips with terminology so that
we're all sure that we're talking about the same
thing (which we rarely are). By establishing a
benchmark, then, standards give us a yardstick to
use to measure with, provide a communications
tool, and also provide minimum acceptance level
for products and materials to protect the finances
of the buyers who buy them and the safety of the
people who use them.

The second major function standards fulfill is
to establish a bridge between old technologies and
new. In this day and age of technological
obsolescence occurring every three to five years,
the value of this function to technology users is
obvious. Standards provide a bridge by allowing
both old and new vendors or systems to implement
the standard, thus interfacing to each other.
It's this very important data link function that
DDES fulfills. Such standards also encourage
small entrepreneurs to build new products, since
the bridges will exist to push from the old to the
new, not to mention the development time it saves
compared to dozens of different interfaces. Not

only does it encourage whole new technologies it
also encourages products that add-on and extend
the life of existing technologies making them more
productive. Since standards promote
entrepreneurship plus extend product life and
functionality, it's easy to see why standards make
possible an environment where the best are allowed
to flourish. Not only does it help the new kids
on the block succeed, it makes it impossible for
the established rank and file to sit on their
laurels and still thrive without the drive and
hustle that got them there in the first place.

I'm fond of calling the Graphic Arts Industry
the largest small business in the world. There
are over 53,000 establishments making this one of
the largest manufacturing industries in the U.S.
Yet over 85% of these companies employ less than
20 people despite the 1.4 billion people employed
by the industry. Furthermore, the percentage of
the $118 billion in revenues this industry
generates that goes to R&D is probably only
measurable in terms of one tenth of one percent.
Of course, if I added in the obsolete capital
equipment that has been bought in the past 15
years that never paid for itself the number might
start to become more reasonable (a number in the
seven to nine percent range would be more
reasonable).

Aside from being a collection of small
businesses, with no R&D, it is also the most
fragmented industry in the world. A person like
me can make a career out of trying to define who's
doing what to whom in this business. This all
adds up to making this industry ripe for standards
development.

Committee for Graphic Arts Technical Standards

With the obvious need, where does the industry
stand today? Well, we've seen more progress in
the past two years than we have in the previous
ten decades. It was almost a year ago that the
first meeting of CGATS took place. CGATS stands
for "Committee for Graphic Arts Technical
Standards", an organization of about 60 Industry
Trade groups, Industry leaders, and material and

equipment suppliers dedicated to supporting and fostering standards within the Graphic Arts. The CGATS activity is a direct result of the standards investigation started by TAGA immediately following the 1985 annual convention.

CGATS has petitioned the American National Standards Institute (ANSI) for accreditation as the official umbrella organization for coordinating Graphic Arts Standards activity. Unfortunately, that approval is currently being delayed because of a negative comment from within our industry itself. As an industry as a whole we appear to possess the ability to shoot ourselves in the foot.

CGATS has three primary functions: (1) Identify those areas where standards are necessary; (2) identify those areas where current standards work is going on, and; (3) either find an appropriate body to write a standard to fill the void, or establish a working committee to do so. At this point, CGATS has already started a standards project registry that has identified approximately 47 standards activities currently in work or completed, created two study groups - one to look at self luminescent displays and one to look at printing plate dimensions; and is investigating the issue of Graphic Arts densitometry standards development. It has also formally endorsed the GATF glossary writing activity and will act as a conduit for getting ANSI approval for the finished glossary.

CGATS will also handle many industry liaison activities within the U.S., such as with X3 which is responsible for many computer industry standards, and standards coordination with overseas and international organizations such as ISO and TC130, the graphic arts arm of ISO.

Digital Data Exchange Specifications

One of the founding members of CGATS was the ANSI Image Technology 8 Committee (IT8). Originally formed in 1985 by Tom Dunn as the Digital Data Exchange Specification group (DDES). In contrast to CGATS, the IT8 has a mission to

actually _write_ standards, specifically those that apply to the exchange of digital data between Color Electronic Prepress Systems and related products.

The IT8 has approximately 38 members, and two primary subcommittees, the User Technical Subcommittee (UTS) and the Vendor Technical Subcommittee (VTS). The UTS is chartered to coordinate user support activities and provide users input and review of the VTS. VTS is chartered with the task of actually writing specifications the vendors can and will implement.

The VTS currently has three task forces which are developing standards. The first, the Color Picture/Line Art Task Force (VPL), has completed the definition of two specifications and is investigating a third. The first specification is entitled UEF00 (IT8.1), and describes a methodology of putting color picture on magnetic tape. This specification has been approved by the full IT8 committee and is undergoing its final stages in the ANSI review process. The second specification is UEF01 (IT8.2), which describes a methodology for putting line art data in a compressed form on magnetic tape. This specification has been approved by the Vendor Technical Subcommittee and is undergoing review by the full IT8 committee. The VPL is now investigating the special case of Monotone and Monochromatic images and how to handle them more efficiently.

The Geometric Art Task Force (VG) is developing a specification for putting geometric art data and image placement data onto floppy disk. Their specification is now essentially approved at the task force level and is undergoing review at the VTS level.

The third Task Force is the Device Exchange Format group (VDEF). The DEF is looking at taking the existing data formats we have defined and providing a direct electronic interface between CEPS and the new digital color proofers being developed. They have selected a strawman, which is the basic starting point for all discussions,

and are now in the phase of developing an understanding of the needs on both sides of the interface in order to make sure an effective interface specification results from this effort.

The VDEF illustrates one of the major advantages of this process. Almost every major CEPS vendor and every major proofing system vendor participates on this task force. The personnel assigned are all competent, knowledgeable engineers working together to arrive at a practical solution they can all live with. There is little, if any, political or marketing gamesmanship being played and the result, because of group interaction, should be a far more effective tool, that all vendors can implement, than any one vendor could have arrived at by themselves.

USER EXCHANGE FORMAT 00 (UEF00)
Color Pictures on Tape

User Exchange Format 00 (UEF00) is the final specification fully approved by the IT8 committee, and is an excellent example of the standards making process. The first task before the group was to get organized and define our purpose. This was aided tremendously by Tom Dunn, who provided the organization; and by the users with a clearly defined purpose. The objective stated by the users was to provide a vehicle for exchanging color pictures between Color Electronic Prepress System (CEPS). Setting the objective and creating the organization was all accomplished at our first formal meeting. Then work began in earnest.

At our second meeting, we reviewed the various techniques each vendor was using to record color pictures on magnetic tape. After all, how different can they be? There were two areas (almost) all vendors had in common. Each recorded each scanned picture element (pixel) as four process colors, with 8 bits (one byte) per process color (or 32 bits per pixel). The "almost" is because while all vendors agreed that the above is a logical exchange format, one vendor was actually working in the uvL color space internally.

The next step was to categorize and resolve our differences. This was a process of compromise based on a philosophy of give and take for all vendors. The specification was defined in such a way that each vendor is able to write a tape with little, if any, data manipulation required on output, but each vendor's software must have the flexibility to read all the various formats that are out there. This resulted in a broad based specification, which with the addition of a number of extended capabilities should provide for not only today's requirements, but any which can be foreseen for the next few years.

The various differences, and how they are resolved, fall into four categories. The first was color sequence, with the vendors fairly evenly split between a CYAN-MAGENTA-YELLOW-BLACK (CMYK) versus a YELLOW-MAGENTA-CYAN-BLACK (YMCK) sequence. Consequently, both are acceptable as UEF. UEF refers to base level specifications which all vendors must adhere to in order to be in compliance with the specification.

The second major issue was how pixels were written onto tape, or the data format of the tape. Most vendors write a complete pixel at a time, followed by the next pixel, and so forth. This format is called "pixel interleaving". However, one vendor writes a line of each color, followed by the second color in the same line, and so forth until the entire line is written, then repeats the process for each line of the image. This format is referred to as "line interleaving". Both formats are part of the base UEF specification.

The third issue involved relating each pixel to a printing dot. Given that eight bits is being used for each color, what does each of the values from "0" to "255" really mean. Once again, we found no two vendors were identical in their coding structure. The one constant was that the values used defined a linear slope (straight line). Therefore, if "0" = 0% dot and "255" = 100% dot, all the values in between fall logically into place ("128" = 50% dot, "64" = 25% dot, etcetera). To accomplish data transfer, each vendor must define the value of the 0% dot and the

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100% dot, and the receiving software will perform whatever conversions are necessary.

The last issue was image orientation. Once again, after polling the first four vendors, we had four different ways to organize the images on tape. One started at the top/left of the logical image and wrote left to right. The next started at the same spot, but wrote top to bottom. The next started at the bottom/left and wrote left to right, while the fourth started at the same point but wrote bottom to top. Therefore, all four image orientations are defined as UEF.

There were numerous other minor issues that were also addressed, such as image resolution and ways to define them, but the above four categories were really the meat of our discussions. We also developed the concept of extended UEF or EUEF, which indicates optional features of the specification. These options provide for such features as RGB and uvL color space, up to 16 color separations, color interleaved data formats, and the other four image orientations not classified as UEF. These options specify how these features will be treated, but do not require that each feature be implemented in order for a vendor to be in compliance with the specification.

Developing the technical agreement required for UEF00 was a process that took approximately six months, and was formally ratified by the original DDES group on May 9, 1986 at a meeting at DRUPA. This is the specification first published in the Dunn Report, Vol. IV, No. 6. To illustrate my earlier point regarding the value of a specification in establishing terminology, we then spent over a year reorganizing the verbiage that surrounds the specification in order to get a suitable ANSI standard. Yet with all that verbiage change, there is absolutely no change in the way computers will put bits onto magnetic tape from the original document. We have just made it easier for other people to understand what we meant via our editorializing.

UEF00 illustrates the standards process very well. There is a lot of compromise, but the

results are even better than any one vendor can accomplish by themselves. The editorial effort will make the final document more understandable to more people because of the group interaction. Hopefully, this is the same path we will follow in the on-going DDES development effort as more standards are completed.

Conclusion

CGATS and IT8 (DDES) are two of the standards activities that are showing tremendous progress. Both will continue to evolve and grow over the years ahead. The problem, however, is to make sure these activities have your support. Not only do standards have a lot in common with taxes, they also represent the antithesis of modern American marketing logic. Today every effort is made to establish a competitive edge - a uniqueness that sets you apart. Standards provide the opposite - a common base of understanding and grounds to bring you together. That is not a popular notion today. Therefore, standards quite often get a lot of lip service, but no personnel or resources.

Fortunately, we have a few people and companies in this industry that have shown a great willingness to take a chance and make a difference. Tom Dunn, of Dunn Technology, is an excellent example with his efforts to get DDES off the ground and keep it moving. Kip Smythe and the National Printing Equipment and Supply Association, Inc. (NPES) is an example of how our industry associations can help with NPES willingness to assume secretariat responsibilities for both the IT8 and CGATS. TAGA itself has made a major contribution by providing an industry forum for initiating CGATS, as well as joining both groups. Individual companies, vendors and users alike have also made a major contribution to this effort by joining and participating in these organizations.

The truth is, if we do put forth the effort - by joining, by sending people to participate, by pushing those we deal with such as the vendors we buy from and the organizations we belong to - we will make the industry as a whole much stronger.

I can't promise you that you will increase your
profits over the next one to three years as a
result of a new competitive edge, but I can
promise that any sons, daughters, nieces and
nephews you have who enter this industry will
have many reasons to thank you in the years ahead.