NCITS-W1:
Developing Standards for Copiers, Printers and Other Office Equipment

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Abstract

This paper describes functions and activities of NCITS-W1, a subcommittee of National Committee for Information Technology Standards (NCITS) and a U.S. Technical Advisory Group (TAG) to ISO/IEC Joint Technical Committee (JTC1)/SC28.

NCITS-W1 was formed in order to participate in the work of the international JTC1/ SC28. This joint ISO/IEC committee is responsible for developing office equipment standards, and its approved scope allows it to develop standards in the areas of copying machines, page printers, facsimile, multi-function equipment, scanners and other office equipment and supplies.

The W1 subcommittee handles standardization of equipment specifications, print quality measurements, throughput and productivity measurements and other related performance measurement and characterization methods. In the past, the subcommittee participated in projects concerning printer throughput (ISO/IEC 10561), copying machine productivity (ISO/IEC 14545), minimum information to be included in copier specification sheets (ISO/IEC 11159), image quality measurements for hard copy output (ISO/IEC 13660), etc. Some anticipated projects include minimum information to be specified for image scanners, print quality requirements for machine-readable franking marks, methods to specify and optimize tone reproduction, and method to connect image quality attributes to visual perception.

NCITS-W1 is a forum to gain broad industry consensus on issues related to office equipment including printers, copiers and other imaging products. The members of NCITS-W1 are either U.S. companies or U.S. branches of foreign companies. The advantages of joining the committee are that a company's desires or policies can influence the consensus for formulating new standards. In addition, a company has advance knowledge of the contents of an emerging standard rather than having to react to a standard which may not be in the company's interest after the standard is issued.

This paper will illustrate activities of NCITS-W1 by describing development of a standard concerning image quality measurements for hard copy output (ISO/IEC 13660).

Introduction

Scope

NCITS-W1 was formed in order to participate in the work of the international JTC1/ SC28. This joint ISO/IEC committee is responsible for developing office equipment standards, and its approved scope allows it to develop standards in the areas of copying machines, page printers, word processors, facsimile, multi-function equipment, scanners and other office equipment. The W1 subcommittee is the U.S. national counterpart of JTC1/ SC28.

Structure

W1 is a subcommittee of National Committee for Information Technology Standards (NCITS). NCITS is one of the American National Standards Institute (ANSI) accredited standards developing organizations, participating in technical development in Joint Technical Committee 1 (JTC 1) of the International Standards Organization (ISO) and the International Electro-technical Commission (IEC). The W1 committee is also a U.S. Technical Advisory Group (TAG) to ISO/IEC JTC1/SC28. That is, NCITS W1 develops national standards, and its technical experts participate, on behalf of the United States, in the international standards activities of ISO/IEC JTC1/SC28. Figure 1 shows the structural relationship of the international and national standard developing organizations.

Members

The members of NCITS W1 are U.S. companies and U.S. subsidiaries of foreign corporations manufacturing

copiers, page printers and other office equipment and supplies.

Example of the Development of a Standard—Image Quality Measurements for Hard Copy Output (ISO/IEC 13660)

The U.S. Government Printing Office (GPO) decided that a standard for methods for measurement of image quality attributes would be very useful in GPO negotiations with printing vendors. This was because of difficulties in writing printing quality performance specifications in printing contracts and problems resolving printing quality disputes. Because there were no standard measurement methods, it was necessary to negotiate the measurement methods with each printing contract.

Manny Olds, a member of the GPO technical staff was selected to carry out the task. She joined the NCITS--W1 office equipment standards committee as the GPO representative and at the same time became a U.S. delegate of the corresponding ISO/IEC international office equipment standards subcommittee (ISO/IEC JTC1/SC28).

She wrote a document stating the need for standard such as 13660, and presented it at an international plenary meeting of ISO/IEC JTC1/SC28 as a New Work Item Proposal (NP). It was approved by a majority of participating and voting countries of ISO/IEC in a letter ballot, and 5 countries or more agreed to work on the development of the standard. Ms. Olds was selected as the project editor.

Ms. Olds formed a working group by finding a group of experts on measurement of image quality attributes. The members were from Japan, Germany, and the U.S. After several face-to-face meetings, much exchange of ideas and working draft texts by email, and some experimentation to test proposed measurement methods, the working group finished a Committee Draft (CD). At this point all comments, objections and desires of the members of the working group had been resolved by consensus of the working group members.

This document was circulated as a Draft International Standard to the International Bodies (for example, ANSI for the U.S., DIN for Germany etc.) for a two-month letter vote. It passed by more than the required 2/3 majority and less than ¼ of the votes were negative. There were some comments, and significant modifications were necessary (by the working group members) to achieve international consensus to resolve the comments.

Final agreement was not reached on the values of graininess and mottle that should be the results of measurement on standard test patterns within the deadline chosen by the working group. (The specifications for this test pattern are included as part of the standard). As a result, these values were not included with the standard. (There is a current project to agree on these values and to submit them as an addendum to ISO/IEC 13660.)

Once final editing to put the document in the proper format and to eliminate all typographical errors was completed by Ms. Olds and other volunteers, the text was sent to the secretariat for publication as an international standard. The whole process took over 4 years—significantly longer than what is considered desirable, but about average for a completely new standard in this committee.

There is a "fast-track" procedure available especially for use in areas with fast-moving technologies. Using this procedure, standards may be completed in 1/3 to ½ of the 4 years required to complete this standard. Recent improved methods for use of the World Wide Web and email are also expected to improve efficiency of standards development.

The standard, ISO/IEC 13660, which is the result of this process, is a set of clear definitions and measurement methods for a basic list of image quality attributes. It is intended to be understandable and useful for a printer or copier owner or buyer for evaluation during hardware use or purchase. It is not an explanation of how to make high precision scientific image quality attribute measurements.
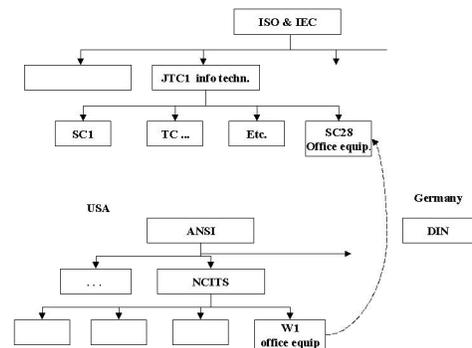

Figure 1. Structures of Standards Developing Organizations

Recent Projects

The following is a list of standards recently published or revised by ISO/IEC JTC1/SC28.

ISO/IEC 10561 Information technology – Office equipment – Printing devices – Method for measuring printer throughput.

ISO/IEC 11159:1996 Information technology – Office equipment – Minimum information to be included in specification sheets – Copying machines

ISO/IEC 11160-1:1996 Information technology – Office equipment – Minimum information to be included in specification sheets – Printers – Part 1: Class 1 and Class 2 printers

ISO/IEC 11160-2:1996 Information technology – Office equipment – Minimum information to be included in specification sheets – Printers – Part 2: Class 3 and Class 4 printers

ISO/IEC DIS 13660 Information technology – Office equipment – Measurement of image quality attributes

for hardcopy output – Binary monochrome text and graphic images

ISO/IEC DIS 14473 Information technology – Office equipment – Minimum information to be specified for image scanners

ISO/IEC DIS 14545:1998 Information technology—Office equipment – Method for measuring copying machine productivity

ISO/IEC DIS 15404-1 Office machines – Facsimile equipment – Part 1: Concepts and classification

ISO/IEC DIS 15404-2 Office machines – Facsimile equipment – Part 2: Minimum requirements for documents to be transmitted

ISO/IEC DIS 15404-3 Office machines – Facsimile equipment – part 3: Minimum requirements for received copies

ISO/IEC DIS 15775 Office machines – Test chart for colour copying machines – Realization and application

Anticipated Projects

The following is a list of JTC1/SC28's anticipated projects relating to image quality and other performance measurements of imaging systems.

Test charts for color devices: This project comprises of development of methods for specifying and optimizing image reproduction on any color device. This includes the development of digital and analog test charts.

Image quality measurement: This project has been proposed to develop a standard for image quality based on human perception. Steps which might be included are: a) define a set of objective image quality metrics that relate to the visual parameters of images, b) define measurement methods for these metrics and c) combine these metrics into an overall image quality metric that correlates with human visual image quality perception.

Measurement of banding: This project is to explain how to measure banding and includes an overall banding metric that correlates well with human visual perception of banding. The resultant standard would be an addendum to ISO/IEC 13660 or a technical report.

Calibration for graininess and mottle measurements: This project will determine the calibration values for graininess and mottle measurements described in ISO /IEC13660. This project will result in an addendum to ISO/IEC 13660.

Minimum information about specification on image scanners: This will be an extension or addendum to ISO/IEC 14473. The proposal is to use test charts to evaluate the operation of an image scanner by comparing the output file of the scanner with the known image properties of the test pattern.

Print quality requirements for machine readable franking marks: This project will results in the development of one or more standards supporting parametric measurements of a set of print quality attributes for machine readable postal indicia.

Membership

NCITS-W1 is a forum to gain broad industry consensus on issues related to office equipment including page printers, copiers and other imaging products. The advantages of joining the committee are that a company's desires or policies can influence the consensus for formulating new standards. In addition, a company has advance knowledge of the contents of an emerging standard rather than having to react to a standard which may not be in the company's interest after the standard is issued. Furthermore, the national body can prevent localized standards that act as non-tariff trade barriers from being developed. An indirect benefit of membership is the technology contacts and communication that the participation affords. By participating in the W1 standard development activities, the members enjoy communication with technical experts who share similar interests around the world.

How to Become a Member

The W1 committee welcomes new members in the development of critical new standards and the review of the existing standards. Anyone interested in starting or participating in standards projects in the area of page printers, copiers, scanners and other office equipment is welcome to join the committee.

Meetings.

The W1 subcommittee meets twice a year; a meeting is hosted by one of its members at his or her work location. In March 1999, the committee met in Washington, DC. Another meeting is scheduled in summer at an East-Coast location. The W1 members also participate in the plenary meeting of the JTC1/SC28 once a year. This year, the SC28 Plenary will meet in Yokohama, Japan in May. The plenary meetings rotate on a four-year cycle between Asia, USA, Europe and Brazil. These meetings last five days and sometimes involve long hours.

The main task at these international plenary meetings is to negotiate the compromises necessary to further the progress on standards being developed. This involves discussions of issues, proofreading and rewriting text for standards and proposals for future work, and writing resolutions to document accomplishments at the meeting.

The W1 and SC28 members collaborate on the projects by utilizing email and telephone. W1 regularly holds teleconferences throughout the year.

Fees

As one of the ANSI accredited standards developing organizations, NCITS supports the U.S. national body. The annual membership fee of the W1, a subcommittee of NCITS, is $300. This fee covers one technical committee principal (voting member) and one alternate, both of which can attend meetings. In addition, an international program fee of $300 is assessed annually to participate in SC28 as a U.S. representative. Of course travel expenses for the meetings are significantly greater than this.

The time requirements for a committee member vary depending on the committee activity level and how much a member volunteers. The latter depends on the specific standards being developed and how important they are to the company sponsoring the committee member. The total time required is between about 5% and 15% of a member's working time.

How To Find Out More Information

In order to find out more information about standards development activities at international and national levels, please visit the following sites at the world wide web.

ISO: http://www.iso.ch
IEC: http://www.iec.ch
JTC1/SC28:   http://www.iso.ch.meme/JTC1SC28.html
NCITS: http://www.ncits.org
W1:   http://www.ncits.org/tc_home/w1.htm

If you need more information regarding the NCITS W1 subcommittee or are interested in becoming a member, please contact the W1 chair, Jean Baronas at:

Jean_M_Baronas@co.xerox.com