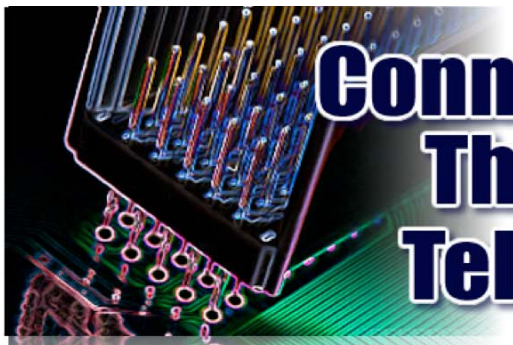

Connector Standards In The Computer And Telecom Industries

Bishop and Associates has just released a new eleven-chapter research report analyzing **Connector Standards in the Computer and Telecom Industries.** This report provides an analysis of major standards development organizations and a select group of connector standards that impact the computing and telecommunications markets. While standardization of individual connectors is a continuing process, the inclusion of connectors in standards of much broader scope, such as VITA), and IEEE is becoming increasingly important.

Standards have played a long and important role in the development of the electronic industry. The creation of standards that address everything from safety issues to intermateability of related equipment have enabled the industry to offer reliable, equipment with assured compatibility produced by a global array of suppliers. The establishment of standardized equipment platforms has allowed the introduction of reference designs that can greatly accelerate the new product development process.

Connectors that conform to a particular standard assure the designer and user of intermateability, a key requirement in an industry that produces a wide variety of interconnected equipment. Many standards address both electrical and mechanical compatibility to a specified limit, at the system level.

Formal organizations such as IEEE (Institute of Electrical and Electronic Engineers) and VITA (formerly VME International Trade Association) have a long-established record of creating industry standards that have shaped the emerging market. More recently, special interest groups (SIGs) and other industry consortia have become particularly effective in promoting system architectures, which include the interconnects. Organizations such as *PCI Industrial Computer Manufacturers Group (PICMG)* focus on a particular class of product. PICMG is an example of a particularly effective consortium of more than 450 companies that collaboratively develop specifications that adapt PCI protocol to emerging market requirements.

From the original equipment manufacturers' (OEM) perspective, designing a new product around an established specification assures system compatibility and a potentially reduced design cycle. Standards groups often sponsor "plugfests" where equipment manufacturers can verify compliance to the specification. Components defined in the specification, including connectors, are often tooled by a wide variety of manufacturers, which assures multiple sources and competitive prices. Designing a system around a standard platform also has its drawbacks. In some cases, the standards development process has taken years to finalize. By the time the standard is released, the technology may have become obsolete making the manufacturer vulnerable to more advanced systems. Adopting an architecture based on a standard also opens the potential for the development of an aftermarket that offers compatible components such as daughtercards. The OEM may lose control of this valuable long-term source of revenue.

Connector manufacturers that choose to tool an industry-standard connector can anticipate the rapid development of a large potential market. The costly decision to tool a new connector is tempered by this confidence. The downside is that a widely adopted standard quickly attracts a host of low-cost manufacturers that are not burdened with the development costs of the interface. Many standards organizations require that the originator of a proposed connector license the ability to tool the product at a reasonable and non-discriminatory (RAND) fee. Potentially valuable intellectual property is made available to any competitor in the market. A standard connector can quickly evolve to commodity product pricing, which reduces the profit margin. Connectors that are designed around an industry standard are typically tooled for high volume and produced in low-cost-of-labor regions of the world. Additionally, there is risk associated with being on the front end of a new standardized interface. If the final standard is not widely accepted in the industry, the specified interface may quickly become obsolete. Sockets that were developed to accept bubble memory devices proved to be a loss to manufacturers that chose to develop and tool this unique interface.

Design of equipment utilizing industry standards continues to grow as price and time-to-market pressures demand a more-efficient design process and the use of cost-effective components.

There are a large number of organizations that are currently active in introducing standards that include connectors. Beyond the formal organizations such as IEEE, and VITA, consortiums and special interest groups are generating new standards at a rapid pace. Recognizing the size of this expanding universe of standards, this report will focus on a select group of key organizations and standards as examples of the influence they are having on the electronic connector market. Prior to that discussion, however, several basic issues of standardization and the standardization process will be reviewed.

- Chapter 2 discusses the “what” and “why” of standards: what they are and why they are important — and are becoming increasingly important — as the complexity of computing and telecommunications equipment continues to evolve.

- Chapter 3 presents a brief history of standardization.

- Chapter 4 reviews the various types of standards relevant to connectors from international standards through national and industry standards to product and component specifications.

- Chapter 5 presents a brief overview of computer architecture as it influences the performance requirements and, therefore, the design of the connectors used in various computer and telecommunications applications.

- Chapter 6 discusses standards based around VMEbus and emerging technologies using the VME mechanical structure and format. Standards developed by VITA through the VITA Standards Organization (VSO) will be the focus of this section.

- Chapters 7, 8 and 9 review standards based around Peripheral Component Interconnect (PCI) technology and emerging technologies serving the same general markets, computer, telecom, industrial and military. Standards developed by PCI-SIG, PICMG, PC/104 and SFF-SIG (Small Form Factor – Special Interest Group) will be discussed in chapters 7, 8 and 9 respectively.

- Chapter 10 provides a limited review of intellectual property issues in standardization with a focus on recent developments in the area of *ex ante* disclosure requirements during the standards development process.

- Chapter 11 contains a summary of major findings and conclusions in the report.

The following Table of Contents shows the detail provided in this new report **Connector Standards in the Computer and Telecom Industries.**

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For Questions in **Europe:**
Mr. Arthur Visser
Bishop & Associates
Phone: (32) 2-660-3696
Fax: (32) 2-675-8374
E-mail: avisser@bishopinc.com

For Questions in **Australia & New Zealand**:
Mr. Robin Pearce
Bishop & Associates
Phone: (61) 2-9674-7584
Fax: (61) 2-9620-8724
E-Mail: rpearce@bishopinc.com

Bishop & associates, inc.
PERFORMANCE AND FORECAST OF THE WORLD CONNECTOR INDUSTRY

1209 Fox Glen Drive
St. Charles, IL 60174
Phone: 630/443-2702 Fax: 630/443-2704
E-mail: bishop@bishopinc.com
Website: www.connectorindustry.com