EDITORIAL

New Data Exchange Formats?

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As the new year begins, there are two new efforts to develop data exchange formats that may affect software utilized by experimental analysis practitioners. While neither effort is complete at this time, these are important developments that may affect what data formats will be accessible to users and vendors in the near future. These possible experimental data exchange formats may eventually become standards that are likely to play a significant role in future experimental analysis hardware and software developments.

Experimental data exchange formats give users freedom to access their data from a number of different analysis programs and give vendors access to users that have various data acquisition hardware. It may be useful for our readers to begin to learn about these two efforts in order to understand what role they will play in the future.

First of all, a little background is probably needed. The primary experimental data exchange format that is in use today in connection with dynamic measurement data is the universal file format (UFF) that was originally established by Structural Dynamics Research Corporation (SDRC) in the 1970s. This data exchange format was based upon an 80 character, ASCII, card image (remember the days when computers worked on a card deck?) concept. The format for a number of different data structures (geometry, components, data, units, etc.) was established in terms of a series of Fortran definitions for each 80 character, ASCII, card image format in a specific sequence so that data for both test and analysis (experimental data, wire and solid models, finite element matrices, etc.) could be exchanged between hardware and software. This structure was naturally extended to an ASCII file structure as discs and operating systems developed further.

The UFF was never adopted as an official International Organization for Standardization (ISO) or American National Standards Institute (ANSI) standard but has been accepted as a *de facto* standard and is widely available in a number of data acquisition and analysis software programs used by experimental analysis practitioners. As time passed and experimental data grew in terms of size and complexity, the original UFF definitions became incomplete and were cumbersome for large data sets due to the ASCII nature of the data format.

Several years ago, additional UFF data formats were defined to augment the formats used for data (UFF 1858) and to add a binary format version of the experimental data structure (UFF 58b). At this time, the UFF is usable but needs an update to handle experimental data structures that are matrix oriented (multidimensional). If you are interested in learning more about the UFF data structure, the University of Cincinnati has been given permission to post the existing UFF data structure definitions at www.sdrl.uc.edu under "Universal File Info."

The first effort to provide a new data exchange structure comes from ASAM (Association for Standardisation of Automation and Measuring Systems). This group was originally formed in 1991 as an initiative of German automobile manufacturers. In 1998, the Association was officially registered with a founding group of 26 member companies that provide financial support for the activity. Today, the Association has over 60 members reflecting a strong influence from the European automobile industry, including manufacturers, parts suppliers and experimental data acquisition vendors (General Motors, Daimler-Chrysler, Porsche, Volvo, BMW, Delphi Automotive, LMS, and MTS to name a few). ASAM is coordinating a wide range of standards that will affect application software and, in particular, integration of applications and peripheral devices.

The experimental data exchange portion of the standards falls under the ASAM Open Data Service (ODS) activity and intends to define a generic data model, data interfaces and data exchange syntax and format. The goal of the ASAM-ODS activity is to provide an easy-to-use, text based exchange format (ASAM Transport Format, ATF) to exchange data, including associated meta information, between different operating systems and different hardware platforms. The use of eXtensible Markup Language (XML) is planned for the data exchange standard. This format was expected to be locked down on January 1, 2004 but at press time was not yet available. For further, up-to-date information please see www.asam.de and, in particular, the ASAM-ODS information under 'Standards.'

The second effort to provide a new data exchange structure comes from the Institute for Environmental Sciences and Technology (IEST). The IEST, founded in 1953 as a not-for-profit association, is a multidisciplinary, international society whose members are involved in a number of environmental test areas including design, test and evaluation of commercial and military equipment and product reliability issues associated with commercial and military systems. The activity of the IEST in the area of an experimental, data exchange format takes the form of a voluntary Design, Test and Evaluation Working Group (WG-DTE-042, Vibration and Shock Data Storage) with a strong influence from the U.S. aerospace and military community (Northrup-Grumman, Lockheed Martin, Spectral Dynamics, m+p International, DSPCon, Data Physics, LMS, NASA-Goddard, AFRL and the NSWC Crane Division to name a few).

This group is very pragmatic and is taking a narrower focus, looking for an existing or new experimental data exchange format that will address the need for storage/exchange of large, binary data formats used mainly in vibration and acoustic testing. The Working Group had its first meeting in May 2003 and is considering a number of options including a MATLAB® (The Mathworks, Inc.) file format structure, a revision/update of the UFF, adopting other formats (ASAM-ODS, for example) or the establishment of a new format. If you want to find out more about IEST, please go to www.iest.org and if you want to become more involved in the Working Group, please see www.iest.org/news/NewGroup.pdf for details on how to become a member and/or provide input to the group.

I hope this gives you something to think about as we move into the New Year. If I can provide any further information, please feel free to contact me. Best wishes and have a Happy New Year! **S&V**

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