SPECIAL LICENSES FOR BUS ADAPTERS OPEN DEC ARCHITECTURE

Without changing policy toward third-party vendors manufacturing Q-bus boards with the functions required by today's systems, DEC is supporting efforts to create bridges to industry-standard bus architectures

by **Brad Harrison,**
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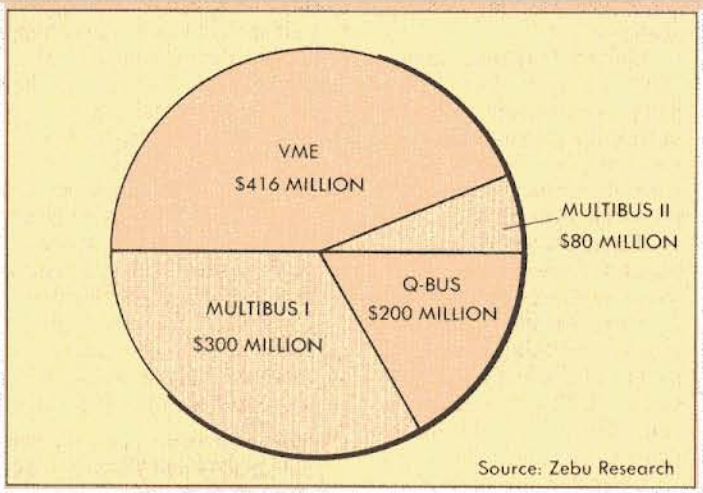
Though Digital Equipment Corp. is claiming an open system architecture via networking standards, it has slammed the door on open bus structures. DEC's newest bus, the VAXBI—backplane interface—for example, is at the heart of the company's most powerful computers. But it's strictly proprietary. Third-party, board-level manufacturers such as Aeon Systems Inc. are only allowed to support it with DEC's permission, using a VAXBI license. This factor limits the number of vendors willing to attempt BI access.

Clearly, DEC is actively discouraging bus add-ons by third-party vendors. And one analyst, Warren Andrews, editor of *InfoBus Report* (Upper Saddle River, NJ), suspects that it may eventually prove harmful to DEC. "Users of DEC equipment are looking for ways to extend the system. When the sources are limited, they look for alternatives. It appears that the viable alternatives are Multibus and VME."

Rick Main, president of Zebu Research (Sunnyvale, CA), agrees: "DEC has over-regulated its 16-bit Q-bus and 32-bit VAXBI bus architectures, so VME and Multibus are benefiting."

Although none of the analysts interviewed have made a study of DEC architectures with Multibus and/or VME crate attachments, Rick Main has made a forecast of board-level products being shipped. And, Main notes, the Q-bus is definitely losing market share and VME is demonstrating a 30% compounded annual growth rate. "Not all of this growth can be attributed to DEC attachments," explains Main, "VME is used in a lot of workstations and that market is growing."



***Projections for 1988 sales of circuit boards for industry-standard buses (not including PC buses) show** the Q-bus losing market share to VME bus and Multibus.*

Easy Migration

Making the transition from the DEC buses to Multibus and VME is being supported by a growing, albeit small, group of third-party manufacturers that includes Aeon, Bit3 Computer Corp., Ikon Corp., MDB Systems Inc., and Performance Technologies Inc. (see "Extending PDP/MicroVAX Functionality," *Hardcopy*, page 112, September 1987).

These companies are indeed easing the integration task with a range of bus-to-bus interconnection products. These products allow you to slowly introduce the extended bus technology while maintaining tight control over the system and ensuring the integrity of the base architecture.

No Software Lost

If you're reluctant to attach a Multibus or VME crate to your DEC backplane for fear of losing your investment in DEC software, don't worry. Most of the co-bus or extended bus architecture adapters, such as Performance Technologies' Q-bus-to-Multibus and VME links, permit peaceful coexistence and interoperability between the bus environments.

In fact, Performance Technologies' adapters couple the Q-bus with the target bus so tightly your system can directly address VME bus and Multibus memory, thus allowing for inexpensive memory extensions.

The notion of bus-to-bus extensions is catching on. Already Performance Technologies is facing stiff competition from newcomer Bit3. Both companies are making similar products (see Report #3, "High-Performance Bus Extensions Break Out of the DEC Cage," page 34, this issue.). But Bit3 isn't expected to ship product until May. What the company can be assured of is a ready and willing market.

Ikon is making itself felt with fast DMA links via control adapters that are similar to DEC's DR11-W DMA interface. Ikon's adapters that reside on the target bus make use of DEC's DR11-Ws on the Q-bus or Unibus backplane or DRB32 DMA interface on the VAXBI—a real plus since it provides a fast gateway from the more powerful BI to the Multibus or VME extensions.

Not to be left out of what appears to be a rapidly emerging market is MDB. Like Ikon, MDB is also emulating the DR11-W and claims to provide bus-to-bus transfers as fast as 3.3 Mbytes per second, as opposed to 2 Mbytes per second claimed by other vendors.

How Many Bits?

DEC supporters argue that Q-bus and Unibus are open and the BI is a closed architecture. Moreover, Q-bus systems like the MicroVAX III seem to indicate that DEC is encouraging third-party add-on board designs and implementations for its buses.

However, open versus closed architecture, although important, doesn't seem to be the main issue—at least not to current owners of often overstuffed and overpriced equipment. Rather, the prime issue is one of performance versus cost.

The Q-bus and Unibus are 16-bit backplanes that are overshadowed by 32-bit desktop microcomputer systems when sheer processing

power is being measured. Comparing a desktop 386 system to the VAXBI, though, is nonsense since they represent two entirely different environments. The BI is clearly the saving grace for DEC in the large system arena, but isn't necessarily equitable to smaller MicroVAX systems.

DEC does seem to have some concern based on recent alliances with Apple Computer Corp. and, according to sources, several VME vendors. Therefore, you can probably expect two new architectures to emerge from DEC:

- a low-end Mac/VAX based on the NuBus 32-bit architecture and
- a MicroVAX IV architecture using the VME bus—which will most likely be dubbed the "Apollo killer."

Small Still Big

Despite the emphasis on 32-bit systems, 16-bit architectures are good enough, claim engineers at Intel Corp. (Hillsboro, OR).

Intel manufactures both Multibus I (16-bit) and the newer Multibus II (32-bit) backplanes, each targeted to different applications. Company spokesman John Dees says that some things just don't need the extra power 32-bit provides. Warren Andrews of *InfoBus Report* suspects DEC's thinking is similar. He contends that there will be lots of Unibus and Q-bus systems around for a long time and they will be extended using 16-bit add-ons rather than the higher performance buses.

The Q-bus architecture, however, is being made less accessible by DEC; for instance, DEC's reluctance to sell unbundled MicroVAX processor boards in small quantities to OEMs. Moreover, DEC exerts strong control over the sale of J-11 CPUs. The upshot, say analysts Andrews and Main, is to invite new bus architectures into the DEC environment.

Challenges to DEC's grip on the backplane shouldn't be a surprise. And clearly Multibus and VME are neck-and-neck contenders to be the extension bus of choice.

Clearly Multibus- and VME-architected systems have the potential of dominating the technical segment of the industry . . . and possibly already do so at the workstation level.

These powerful data highways are capable of accommodating single or multiple processors. Additionally, the building-block nature of the buses, especially VME, allows them to span the entire range of processing capability.

Consider, for example, stringing together multiple VME crates to create a fully distributed processing system capable of handling hundreds of users. Companies such as NCR (Dayton, OH) and Prime Computer Inc. (Natick, MA) are employing VME architectures to create UNIX-based office systems with several times the power of their MicroVAX counterparts, but at less than half the cost.

Moving Market

DEC users are buying bus-to-bus adapters. Don Turrell, products manager at Performance Technologies, says there are two reasons a DEC user wants to buy bus adapters: "About half want to take advantage of special-function Multibus or VME boards, and the other half are simply extending their systems via other bus structures."

Aeon's DEC-licensed VAXBI-to-VME bus product is testimony to DEC's realization that there is a need to communicate with other system architectures. To this end, DEC has also awarded Aeon a VAXBI license to develop a Multibus II adapter. This control over the backplane is obviously self-serving on DEC's part, but if you're a qualified vendor, all restrictions are non-existent at the attached bus level.

Given DEC's ambivalent stance of licensing third-party bus couplers on the one hand, but refusing to allow third parties to build board-level products on the other, it's impossible to second guess what is going to happen.

However, based on what we've seen to date, you can probably expect to see a plethora of bus-to-bus adapters for a host of bus architectures in the near future.

Additional information about the products or services described in this article can be obtained by contacting the company directly or circling the appropriate reader service number.

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THE VIEW FROM MAYNARD. . . .

Though Digital Equipment Corp. has been criticized for the limited variety of BI-compatible board-level options it offers, it's often forgotten that the BI is barely two years old. "Already some 50 licensees provide more than 65 applications for the BI" says Steve Ladew, a principal marketing specialist at DEC.

In contrast, the VME bus has existed since 1979 and initial development activity on Multibus II began in 1984. "The BI's competitiveness with the other [32-bit] buses is a performance and marketplace maturity issue," says Ladew. "The BI has greater performance, but is much younger."

Additionally, "You have to look at the system from a wider point of view [other than simply just what bus attachments exist]," says Dave Wells of DEC's Channels Marketing Group.

BI on Track

"With the BI, the idea was to keep it electrically secure," says Ladew. "DEC has learned from experience [with the Q-bus and Unibus] that the bus must be governed to ensure that all the equipment plays together properly." Thus, the licensing program.

Ladew claims that nine out of 10 BI license requests submitted to DEC are granted—this translates to two to three new licenses per month. "We're not being restrictive—on the contrary, we're encouraging new players to submit their applications. The only requirement is that the product be complementary to VAX systems. Let's face it—we're out to sell VAXes." Ladew expects to eventually see some 200 to 300 VAXBI licensees—and complete bus compatibility between all products. "DEC went to great efforts to specify the BI, and now the whole plan is running smoothly," he says.