ONE of the least recognized trends in information technology (IT) today is the wholesale, worldwide move to enterprise distributed computing. Examining a trend of such complexity seems to be difficult, but in fact it is simple. Does your company operate more than one computer? Does it have more than one employee? Of course. And since the operation of the company as a whole entity is reflected in its people and computing systems, effectively today’s enterprises are distributed enterprises, and their IT infrastructures are in fact distributed computing infrastructures.

Unfortunately, in most enterprises that distributed computing infrastructure is fractured and haphazard. While there may be corporate standards for the underlying interconnectivity, there is rarely even a detailed plan for interoperability and integration of enterprise applications on that interconnection network. The world’s computing newsletters are littered with decision-trees for designing local- and wide-area networking solutions, but are comparatively silent on the far more important issue of application integration. What is the point of 100MB/s fiber networks if the accounting offices must hand-carry reports to the factory floor for re-entry, re-formatting and re-integration?

For the last nine years, the Object Management Group (OMG), a non-profit consortium of about 1,000 member companies with members and offices worldwide, has built a series of standards for distributed computing infrastructure. This Object Management Architecture, centered around the Common Object Request Broker Architecture (CORBA) and Unified Modelling Language (UML) supports the construction of systems of integrated applications across the enterprise, from mainframes and supercomputers to mid-range computers, desktops, handhelds, embedded systems and real-time controllers.

The classic problem of the factory floor manager has always been one of the OMG problem statements. The average factory floor manager must:
- roll up in-process data from real-time programmable controllers on the floor,
- with Enterprise/Manufacturing Resource Planning inventory data from minicomputers in the factory’s machine room,
- generate correlations, generally on his or her desktop computer,
- combine with report charts and graphics, often from a workstation system,
- and deliver the result to management via a mainframe system at the headquarters back office.

All of this complex dance of interconnectivity must be achieved with an amalgam of networks and protocols that are certainly not the primary job function of the factory floor manager!

Enabling this vision of connectivity — and in many vertical markets, not just manufacturing — is referred to as the Global Information Appliance. Simply put, one ought to be able to connect one’s computer — whether mainframe or minicomputer, desktop or embedded system — into the world’s computing infrastructure as easily as one connects to the world’s electric power infrastructure. And the only approach to achieve this new level of application integration is through the use of object-oriented system design.

The OMG’s course of actions since its formation in 1989 began with the definition of the Common Object
Request Broker Architecture (CORBA), aimed squarely at the enterprise distributed system integration problem. CORBA takes an object-oriented view of the enterprise, with applications being the objects, communicating with each other via requests (messages) outlined in well-known interfaces recorded in interface repositories. CORBA has gone through several revision iterations since 1991, but remains true to the vision of interconnecting systems; there are interoperating CORBA implementations for most mainframes, minicomputers, workstations, desktop systems and embedded processors, encompassing nearly 100% of modern systems (and most others as well!).

This unprecedented level of agreement in the industry was reached by a standards process of consensus-building guided by most of the world's leading computing hardware and software companies. Companies that otherwise compete strongly use the OMG standardization process to agree on object-oriented interface specifications that solve customer integration problems.

The future evolution of the OMG Object Management Architecture also bodes well. As 1998 draws to a close, the OMG membership completes specification work in important areas such as component software composition and business objects, which hold the promise of allowing enterprises to define their business models once, in portable, interoperable business object descriptions, and move them anywhere in the distributed computing infrastructure at will based on requirements of locality, performance and cost. Indeed, the mobile agents framework extensions of the architecture allow dynamic movement of such component software without the need for additional programming.

This hints at this year's great move in systems design. The object orientation focus was for some time on the client, allowing the creation of more effective and usable graphical user interfaces from X Windows to modern Java- and XML/DHTML-enabled browsers. This year, unparalleled support for integration across the enterprise has allowed leading-edge enterprises to use object-oriented integration frameworks like CORBA, and object-oriented design standards like UML to leverage their corporate assets, their installed bases of corporate data and applications. For years reuse has centered on small software units; but think of the cost effectiveness of reusing entire application suites such as general ledger and resource planning applications across enterprise networks!

As the millenium edges near, the unprecedented consensus among competitors which built CORBA and UML is turning into equally unprecedented successes in deploying this technology. CNN, Hong Kong Telecom, Singapore Telecom, Home Depot, Goldman Sachs and Wells Fargo Bank have all benefited from fielding this technology early; now the next phase comes into play, as these companies realize that their well-defined applications bases (intranetworks) will allow them to easily connect to each other, in worldwide extranets of shared, secure, transactional information. The Global Information Appliance has not yet arrived, but we will live to see it.