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Impact of Large Scale Integration (LSI) on Small Data Processing Equipment (p. 2)  “The last five years have seen a dramatic increase in the use of remote terminals tied to large digital processors. ... 10 times as many circuits are needed in the peripheral equipment ... than the central processor. ... [Thus,] it should be clear that we are dealing with a market that has an exceedingly high volume potential, has relatively modest speed requirements, needs functional packaging, and must exist in generally unfriendly environments. In addition, the logic technology must be capable of interfacing with electromechanical circuits. These constraints can clearly be fulfilled [within certain limitations] by an appropriate adaption of [LSI] technology. Referring to our preceding example, and assuming that we have 100 logic circuits per semiconductor package, we can see that four such packages can fulfill the logic requirements of the remote terminal. ... It should be clear that a large and profitable market exists for the application of LSI to the peripheral equipment in digital computers, especially for the multiprocessing, time-sharing applications. “[Editor’s note: This article correctly argued about the need for LSI, but failed to foresee both the extreme growth in degree of integration and the ever-expanding application fields.]

Automated Artwork (p. 5)  “At the June 1968 Computer Group Conference in Los Angeles, there were a number of evening sessions devoted to panel discussions and free-wheeling exchanges on the subject of LSI. These ‘dig deeper’ sessions, as the name suggests, delved into issues that could only be highlighted during the daytime sessions. [In] Dig Deeper Session 3, ... [t]hree methods of producing microphotographic masks for use in integrated circuit fabrication [were presented]. ... Artwork of a single circuit or cell is prepared usually at 200 to 500 times the final size. ... Each panelist discussed a different problem of translating designs into photographic tooling. ... As can be seen, optically reducing maximal resolution artwork can result in a final pattern area of 250 x 250 mils with the smallest element size of 0.1 mil.” [Editor’s note: In 1968, very intensive work was being performed in the field of LSI, but none of the speakers could have foreseen the progress that soon followed. The millions of components now integrated in one chip have enabled the small, smart devices seen everywhere today.]

Let’s Set the Record Straight! (p. 12)  “It’s time to step up the counterattack on the way computers are being presented to the public. ... When a system employing a computer makes a mistake, it is reported widely as a computer mistake, and there is glee and rejoicing throughout the land. This is symptomatic of the public’s attitude toward our machines. This attitude reveals some public fear of computers, as contrasted to the way we see these machines—as powerful and useful tools. ... Though there are a growing number of articles and programs giving us a fair shake, they are far outweighed by the opposite fare, and we need to stir ourselves to help set the record straight. ... Drop the special terminology we use, and show them how our technology makes things cheaper, or makes [people’s jobs] easier, increases [their] security and safety, increases [their] prestige, or whatever criteria [people use] to cope with [their] everyday aspirations and fears. ... Speak in terms of what is being done if at all possible, instead of what we foresee will be done in the future.” [Editor’s note: This discussion reminds me very much of today’s conversations about AI’s future capabilities and the fears raised as consequence.]

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Internet Resource Discovery (p. 8)  “Resource discovery services now help users locate and retrieve information. These services contain tools for browsing, searching, and organizing information distributed throughout the Internet. Browsing tools let users navigate the information space to find the specific data they need. Indexing search tools automatically locate relevant data on the basis of user interest. Independent of the approach used, resource discovery services can also help users organize newfound information so that they can refer to it without having to repeat the entire discovery process. We present an overview of the resource discovery
services currently available on the Internet. Because resource discovery has been the subject of intense research, this article is not meant to be exhaustive. WAIS is a full-text information-retrieval architecture whose clients and servers communicate through an extension of the Z39.50 protocol. The Archie 2 service addresses the problem of locating files by attribute (files are currently listed only by their names) in the Internet. The Prospero name space forms a generalized directed graph, in which intermediate nodes are directories, leaves are files, and edges are Prospero links. Gopher organizes information into a hierarchy in which intermediate nodes are directories, or indexes, and leaf nodes are documents. WWW architecture is based on the client-server model, with WWW clients providing users with a hypertext-like browsing interface. Besides its native hypertext transfer protocol (HTTP), WWW clients understand FTP and the network news transfer protocol (NNTP). Netfind builds its indexing database, called the seed database, by using data scattered across multiple existing sources, such as network news messages, the domain naming system (DNS), the simple mail-transfer protocol (SMTP), and the finger utility. X.500 entries consist of a set of attribute-value pairs. X.500 accepts attribute-based queries. The directory’s name space is hierarchically organized and distributed among its servers.” [Editor’s note: The article provides an overview of the information discovery methods available in 1993. With the exception of Gopher and, of course, the then very young WWW, the systems are based on directory building and querying through them. We all know which was ultimately most successful.]

Internet Resource Discovery at the University of Colorado (p. 25) “At the University of Colorado, my colleagues and I have built and experimented extensively with a tool called Netfind, which locates electronic mail addresses and other information about Internet users, based on widely distributed sources of simply structured information.” [Editor’s note: The authors not only describe Netfind in detail but also offer a good analysis of other information discovery systems. Interestingly enough, they also discuss the security and privacy issues that arise with any information discovery in the Internet—a problem far from being solved today.]

Modeling and Distributed Simulation of a Broadband-ISDN Network (p. 37) “Network simulation is often limited to a few nodes. A network of workstations configured as a loosely coupled parallel processor and a distributed algorithm permit simulation of complex networks.” [Editor’s note: The article is concerned with the simulation problems encountered with the then actively pushed ISDN network. Despite the fact that ISDN eventually failed, the article is worth reading because it analyses many of the problems encountered in such simulations.]

A Systematic Approach to Designing Distributed Real-Time Systems (p. 68) “In essence, GRMS (generalized rate monotonic scheduling) theory ensures that as long as the system utilization of all tasks lies below a certain bound and appropriate scheduling algorithms are used, all tasks will meet their deadlines. Next, we present a simple example that illustrates how to apply GRMS extensions to schedule a distributed system containing real-time control activities and multimedia communication.” [Editor’s note: Although GRMS did not spread very far, the article identifies—using a real-time extended GRMS—many of the problems faced with real-time requirements in, for example, media streams and today’s Internet of Things environment.]