

**A Scalable Organisation For the
Development of High Performance
Computing and Communications Software
and Systems**

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InfoMall:
**A Scalable Organisation for the Development of
High Performance Computing and
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Abstract. InfoMall is a programme lead by the Northeast Parallel Architectures Center (NPAC) featuring a partnership of over twenty-five organisations and a plan for accelerating development of the High Performance Computing and Communications (HPCC) software and systems industry. HPCC (or HPCN as it is known in Europe) is a critical technology which will have unprecedented impact on industry, education, society, and defense. Acceptance of HPCC by these real world sectors is held up by the extremely hard problem of HPCC software development. InfoMall employs a novel technology development strategy involving closely linked programmes in technology execution and certification, software development, marketing, education and training, economic development and small business support. InfoMall has excellent HPCC and other facility infrastructure. InfoMall partners have unrivaled expertise in all the areas critical to rapid development of the HPCC software industry. The process is constructed and explained by analogy to the full-service set of stores found in a shopping mall. InfoMall is a concept which can create 15,000 jobs in New York State alone, and be scaled in future years to create an order of magnitude more jobs nationally.

1 Introduction

InfoMall is an innovative technology transfer programme designed to help create an HPCC software industry and produce new software products and services for the information age. InfoMall uniquely combines economic development funding, high technology research centers, industrial partners, small business entrepreneurs, and business support organisations to apply state-of-the-art information technologies to industry, school districts, hospitals, small businesses, and government services.

We use the powerful analogy of a retail shopping mall to communicate our approach to linking emerging technologies, “virtual corporations”, business support, and new markets. As in a shopping mall, InfoMall will contain superstores of equipment vendors (such as Digital, IBM, MasPar, New York Telephone, Oracle), large company and small business product stores (Kodak, Martin-Marietta, MCC, NYNEX), software boutiques (Portland Group Inc., CRi, Isis, Sonnet Software), an education wing (NPAC, Booz-Allen Hamilton, Cornell, The Center for Research on Parallel Computation (CRPC), NYSERNet) a marketing wing (Booz-Allen Hamilton, IBM Federal Systems Company, Integrated Systems Solutions Corp., Sterling Software) off-the-shelf technologies, incubator space, and a jobs office.

Consumers of InfoMall products will have different needs and will shop in different parts of the mall. Industrial managers might enter the mall through training courses and workshops offered in the education wing. Software companies may seek out a combination of off-the-shelf technologies and emerging technologies that have not yet reached the marketplace. Large corporations can visit the marketing wing to develop new markets for products enhanced by InfoMall technologies. Software engineers can work directly and closely with InfoTeam members.

A central element of InfoMall is the *technology wing*. As a high technology university research center, NPAC is closely linked, often as research partners, to the leading technology development centers in the USA (Center for Research on Parallel Computation, Cornell, Rome Laboratory). InfoMall is gathering the best technologies available (e.g., networks, computer architectures, software, databases) and puts these resources to work in the local economy. InfoMall partners in industry help connect small InfoMall companies with new markets, and support dynamic links among small companies that team as a “virtual corporation”. InfoMall’s economic development partners (New York State, Technology Development Organisations, the New York City Partnership) provide business and financial support, and will help InfoMall stimulate employment.

To put emerging information technologies to use, InfoMall supports a number of discrete steps for connecting technology developers with end users. Emerging technologies must first be integrated, via the technology wing, into the mall “technology stores”. For example, a new database system might be implemented on a variety of parallel computers to evaluate the strengths of each approach. Software teams developing new products draw upon InfoMall technology resources, along with related technical and business support services.

For example, an on-line database service might also require use of parallel search algorithms and high speed networking facilities. The product of this software team may then become part of a larger set of technologies and services offered by an integration company, which has expertise in bringing new technologies into the marketplace. The end user finds a solution to a problem. Software teams produce innovative products for the marketplace based on the latest information technologies. InfoMall provides “one-stop shopping” for the necessary technologies, technical and business support, and market opportunities

resources.

InfoMall projects under present development include environmental modeling (in collaboration with IBM), electric power transmission simulation (Niagara-Mohawk Power Corporation), electronic access to image libraries (Kodak), fraud detection in health care payments (Booz, Allen & Hamilton, The Federal Bureau of Investigation), financial modeling in the stock market (NPAC and IBM), electromagnetic simulation (Syracuse Research Corporation), collaborative cardiology and heart surgery (Veterans Administration Hospital, NYNEX), and combining electronic entertainment with education (Abrams Gentile Entertainment and NPAC itself).