THE JOHNS HOPKINS NATIONAL SEARCH FOR COMPUTING APPLICATIONS TO ASSIST PERSONS WITH DISABILITIES

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GUEST EDITOR'S INTRODUCTION

INTRODUCTION

The recently passed Americans with Disabilities Act offers exceptional opportunities for millions of people with special needs to reach their full potential. The Johns Hopkins University Applied Physics Laboratory conducted the second (1991–92) National Search for Computing Applications To Assist Persons with Disabilities to help realize the exciting promise of the act.[1] The competition inspired hundreds of innovative computing applications to extend the reach of persons with disabilities.

OBJECTIVES OF THE NATIONAL SEARCH

The five objectives of the Second National Search were to:

1. Focus the power of computing technology on the needs of millions of citizens with disabilities.

2. Foster individual innovation and creativity throughout the nation.

3. Encourage people; professional societies; and industrial, academic, civic, and rehabilitation organizations to work together to meet the needs of disabled persons.

4. Improve the education of students with special needs through innovative multimedia and computer-assisted instruction.

5. Stimulate broad new public involvement.

THE NEED

Over 40 million people in the United States have disabilities. The National Search marshalled the efforts of tens of thousands of dedicated professionals, volunteers, family members, and friends in helping to enhance the quality of life and fulfill the potential of differently abled people.

Low-cost computer-based enabling technology, together with adaptive software and applications devices, has special potential to facilitate independent living and increase the capacities of disabled persons to learn, work, enjoy leisure activities, and integrate themselves into their communities. The National Search directly encourages thousands of computer users to think seriously about how their tools could be usefully applied to improve the lives of citizens with disabilities.

ORGANIZATION

Although the National Search had only modest seed funding, it was structured to promote individual and in-

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- National Science Foundation
- MCI Communications Corporation
- Microsoft Corporation

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stitutional commitments on a grand scale. The contagious enthusiasm, creativity, and dedication of thousands of contestants, organizers, and supporters turned the venture into a nationwide movement.

Figure 1 shows the overall organization of the program. The National Science Foundation, MCI Communications, and Microsoft Corporation were the primary sponsors. More than twenty other organizations contributed and participated as program associates. A hands-on
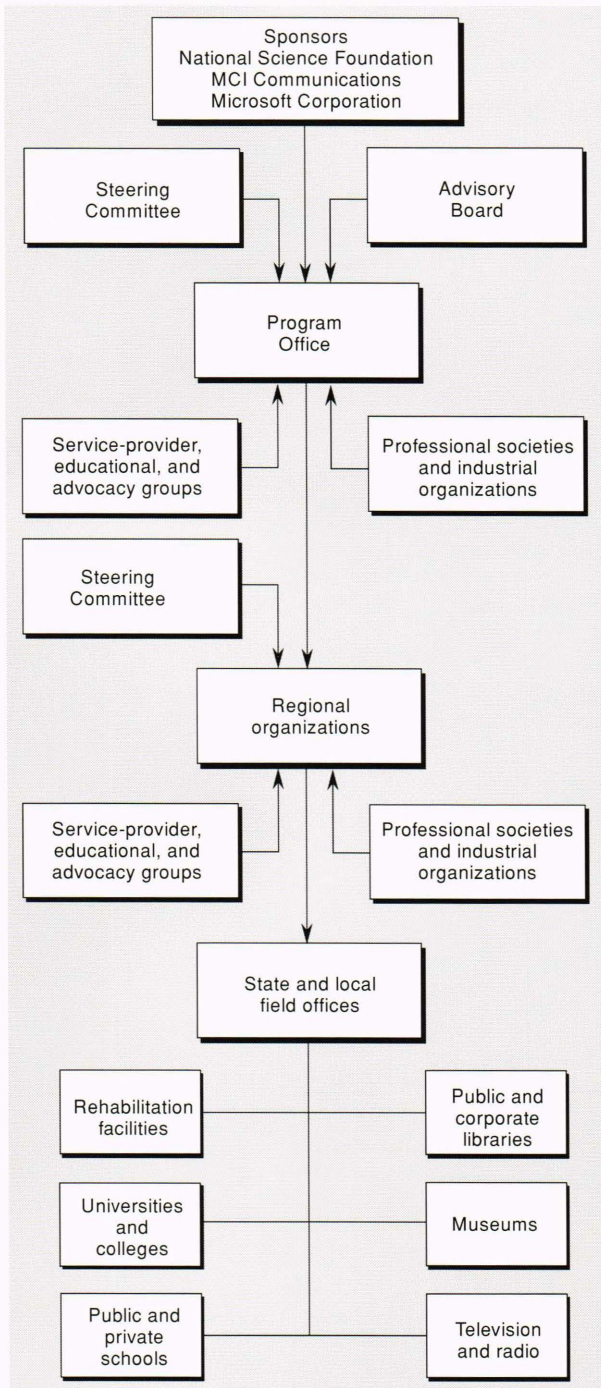
Figure 1. Program organization of the National Search for Computing Applications To Assist Persons with Disabilities.

steering committee and an advisory board consisting of twenty-eight nationally recognized leaders (many with disabilities themselves) provided overall guidance and direction. The Advisory Board included highly dedicated representatives from the private and public sectors with expertise in helping the disabled through education, technology, multimedia applications, and rehabilitation.

The board met regularly throughout the planning, competition, and evaluation phases and formed action teams to address the following:

Definition of the overall scope of the program.
Public relations efforts and methodology of reaching participants.
Contest induction/entry procedures.
Development of criteria for selection of winners.
Judging and awarding of prizes.
Television promotion.
Events planning.
Future development/implementation of ideas.

Team assignments took advantage of the special talents and resources of individual Advisory Board members. Of significance were the many personal contacts gained from extensive involvement with field organizations dedicated to assisting disabled people. Without the support and leverage of these participants, it would not have been possible to identify and enlist the hundreds of people who did the essential work at the regional levels.

THE COMPETITION

Contestants

The National Search called for entrants from four categories:

1. Individual computer professionals (private): persons whose jobs involved computer hardware or software.

2. Individual computer professionals (organizationally supported): inventors supported by organizations having rights to the inventor's intellectual property.

3. Amateurs: those whose jobs did not involve computer or software design or application.

4. Full-time students.

These categories were intended to encompass all likely competitors and provide a spectrum of computer knowledge and skill levels. Teams were also encouraged; many entries were the result of collaborations that included the efforts of a technical contributor, a service provider, a disabled person, and a relative or friend.

Categories of Entries

Inventions were invited in three categories:

1. Computer-based devices: hardware invented or modified for the intended purpose, or working hardware/software that could demonstrate a new application.

2. Software only: specialized software programs for standard computers.

3. Paper design: a written description of an idea not yet implemented.

Tables 1 and 2 show the distribution of entries in the competition by targeted disability and category of participant, respectively, in the ten standard federal regions (Fig. 2). A summary of the 100 regional winning entries appears in this issue.

Publicity

Comprehensive publicizing of the competition was critical to reach as many computer-capable people as possible. Beginning with a kick-off press conference at the National Press Club in Washington, D.C., on 30 January 1991, promotional work spanned eight months; strategies ranged from fourteen satellite-

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broadcast television workshops to sending releases to over 1000 newspapers. A toll-free hot line was also established. Magazines and journals carried announcements; professional societies promoted the National Search; major technical, educational, and rehabilitation conferences included announcements in their programs; and colleges and universities featured the competition in their varied media. Announcements were made on radio and on television. Hundreds of computer clubs were contacted. In response, thousands of requests for information were received, and tens of thousands of fliers were dis-

tributed. Over 3000 entry kits were mailed, and 774 competition entries were submitted by participants from all fifty states.

Regional Organization and Activities

Regional chairpersons were appointed along with their (volunteer) staff support (Fig. 3). Local workshops, induction activities, and fairs were held in all ten standard federal regions of the United States, covering districts from Puerto Rico to Hawaii and Florida to Alaska.

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Table 1. Distribution by disability category.

Category	Standard federal region										Total
	1	2	3	4	5	6	7	8	9	10	
Movement	24	24	39	26	37	17	8	5	48	5	233
Hearing/language	14	23	34	14	24	7	2	3	23	5	149
Vision	13	12	25	22	25	6	1	4	21	8	137
Learning	7	17	18	18	22	15	0	1	14	4	116
Combined	7	10	9	4	10	8	4	4	10	5	71
Neurological	6	5	4	10	5	2	4	1	7	0	44
Mental retardation	2	5	3	4	4	1	1	0	3	1	24
Total	73	96	132	98	127	56	20	18	126	28	774

Table 2. Distribution of competition level.

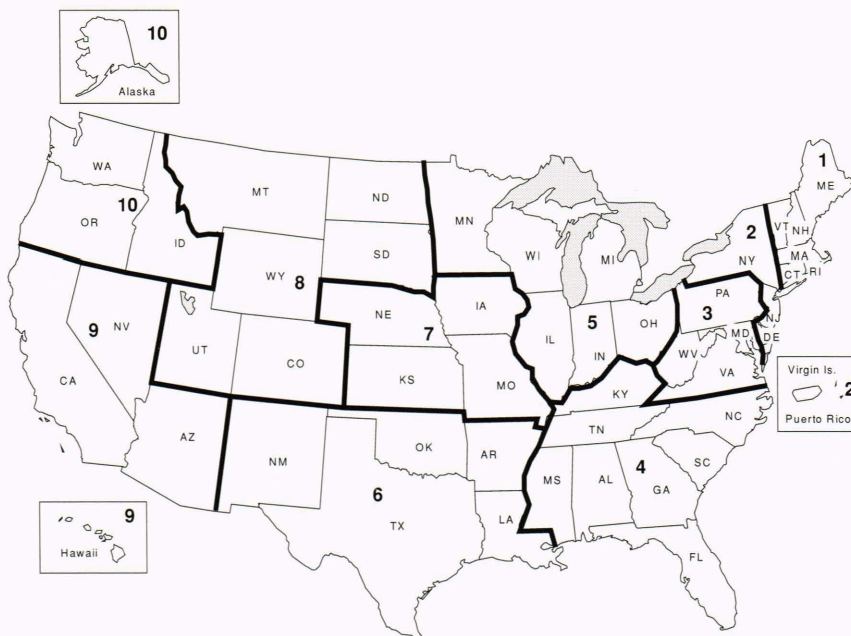| Participants	Standard federal region										Total
	1	2	3	4	5	6	7	8	9	10	
Professional (private)	22	35	54	30	43	22	9	6	33	9	263
Professional (organizationally supported)	18	25	36	21	24	10	2	5	31	5	177
Amateur	27	29	34	36	43	17	8	6	49	13	262
Student	6	7	8	11	17	7	1	1	13	1	72
Total	73	96	132	98	127	56	20	18	126	28	774

Figure 2. The ten standard federal regions.

Regional workshops were held in April 1991 simultaneously across the country, featuring a teleconference using the Black College Satellite Network from the CNN television studio in Washington, D.C. Through the various media, interested persons were encouraged to attend their regional workshops and participate in briefings. The briefings included the teleconference, which allowed interaction with the leadership of the program as well as experts in a wide range of disabilities and technologies.

The regional fairs in December 1991 were staged so that entrants could demonstrate their inventions to the public and to the judges. Fairs were held at prestigious public sites such as the Exploratorium in San Francisco, museums of science in Chicago, Boston, and Dallas, the Children's Museum in Denver, and the Columbia Uni-

Figure 3. Regional chairpersons from all ten federal regions attend an APL planning meeting.

versity Medical Center in New York. U.S. Senator Paul Sarbanes keynoted the Region 3 Fair held at APL (Fig. 4). Other dignitaries officiated at fairs around the country.

The public attended and interacted enthusiastically at these grass roots events. The regional judges selected the local winners, whose entries were then qualified to compete nationally.

Judging

Evaluation of entries was a feature of the program that required and received much attention. Competition entries were judged on the basis of both technical and functional merit. An effective approach and appropriate criteria had to be devised to ensure that all entries would be evaluated fairly. In addition, it was necessary for all persons involved in the evaluation to understand the judging scheme. Each entry received multiple reviews. More than 250 volunteer judges, including many with disabilities, were recruited from technical, educational, and rehabilitation organizations to conduct the evaluation and judging activities.

Numerous awards, including personal computers and cash prizes, were presented to regional winners. From these, thirty national finalists were selected to exhibit their inventions at the National Fair (Fig. 5), held on 1–2 February 1992 at the Smithsonian Institution in Washington, D.C. Inventions were on public display (Fig. 6) for final judging. Thousands of interested visitors attended. The event was telecast worldwide on CNN and received in-depth coverage by National Public Radio, *The New York Times*, *The Washington Post*, and extensive regional and national media.

Prizes

More than 100 prizes were awarded to the National Search contestants, including a $10,000 Grand Prize. The Awards Program, including the presentation of many regional and national prizes (Fig. 7), was made possible by contributions in cash and other items by twenty-four National Search Program Associates representing a broad spectrum of private sector organizations.

Figure 4. U.S. Senator Paul Sarbanes tours the Region 3 Fair.

Figure 5. National judges interview thirty finalists.

Figure 6. DARCI TOO: An Alternative Computer Input Device, is displayed at the National Fair.

Figure 7. The youngest merit award winner addresses the Awards Ceremony.

THE FUTURE

A two-day "National Search Workshop," held at APL on 4–5 February 1992, was attended by competition participants and representatives from government, industry, academia, and many organizations dedicated to serving persons with disabilities. Invitees were selected for their expertise and ability to carry results of the National Search to their respective organizations. They provided valuable insights and guidance to help competition entrants accelerate the transfer of their "inventions" to the people who need them. The challenge of moving from prototype to product was addressed in detail by knowledgeable speakers, and several related issues and approaches were explored. An edited transcript of the discussions that occurred at the workshop appears in this issue. The National Search Advisory Board, which has recommended that a National Search be conducted every four years, will continue to plan and pursue future enterprises involving both the public and the private sectors in the quest for computer applications to assist disabled persons.

CONCLUSION

The National Search has done much to help focus technology and public awareness on the needs of persons with disabilities. It created a very special partnership that brought together the creativity of computer users, the indomitable spirit of people with disabilities, and the commitment of those involved in rehabilitation and education. This, in turn, coalesced thousands of volunteers and specialists in all disability categories to produce a nationwide interdisciplinary grass roots movement.

The Americans with Disabilities Act has laid a strong foundation that promises a new era of opportunity. In the end, however, it is the powerful partnership between creative, committed people and enabling, empowering technology that will turn this promise into reality and provide unprecedented fulfillment for people with disabilities.

REFERENCE

[1]*Proc. Johns Hopkins National Search for Computing Applications To Assist Persons with Disabilities*, ISBN 0-8186-2730-1, IEEE Computer Society (1992).

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PAUL L. HAZAN is Assistant to the Director for Advanced Computer Technology at The Johns Hopkins University Applied Physics Laboratory. He was the Director of the National Search for Computing Applications To Assist Persons with Disabilities. Mr. Hazan served as a member of the Board of Governors of the IEEE Computer Society as Director for Micro and Minicomputers, and was founding chairperson of the IEEE Personal Computer Technical Committee.