PART 2

Gains in Technical Knowledge

One of ATP's major goals is to build the nation's scientific and technical knowledge base. Each of the first 100 completed ATP projects targeted a number of specific technical goals designed to achieve a new or better way of doing things. The knowledge created by each project is the source of its future economic benefit, both for the innovator and for others who acquire the knowledge. It is a good starting place for assessing completed projects.

New Technologies and Knowledge Gains

Knowledge gains by the 100 projects are diverse and encompass, within their wide range, the following: mathematical algorithms underlying new software tools; the science of growing human tissue; new techniques for fabricating high-temperature superconducting devices; optical technology for increasing brightness and clarity of miniaturized and projected displays; and new chemical formulations. Advances were made in each of the five major technology areas.

The technologies developed in the 100 projects are listed in column B in Tables A.1–A.5 in Appendix A. The set of tables provides the reader with a convenient, quick reference to the entire range of technologies. The entries are arranged alphabetically, using the five technology areas shown in Figure 1.2. As was mentioned earlier, most of these projects are interdisciplinary, involving a mixture of technologies and generating knowledge in multiple fields.

Even those projects that were not fully successful in achieving all of their research goals, or those that have not been followed by strong progress in commercialization, have achieved knowledge gains. Moreover, some of the projects carried out by companies that have since ceased operations or stopped work in the technology area yielded knowledge, as indicated primarily by the presence of publications and patents. In these cases the direct market routes of diffusion of knowledge gains through commercialization by the innovators are likely lost. However, the indirect routes—whereby others acquire and use the knowledge—remain.

Of What Significance Are the Technical Advances?

Measuring the significance of technical advances is challenging. One factor that challenges measurement is the length of elapsed time that typically separates an R&D investment and its resulting long-term outcomes. In the interim period, various short-run metrics may serve as indicators that project results appear to be on track toward achieving long-term goals. One metric that has been used to signal the significance of a project's technical achievements is formal recognition in the form of an award from a third-party organization.

Twenty awards for technical accomplishments were made to participants for achievements related to ATP-funded projects. Participants in 13 of the 100 projects received awards for their technical achievements. Participants in five of the projects received multiple technical awards. Table 2.1 lists the awards made to these projects by third-party organizations in recognition of their technical accomplishments.

Table 2.1 Outside Recognition of Technical Achievements of the First 100 Completed Projects

Project Awardee	Year	Awarding Organization	Award
American Superconductor	1996	*R&D* Magazine	One of the 100 most important innovations of the year.
American Superconductor	1996	*Industry Week* Magazine	Technology of the Year award.
Communication Intelligence #1	1997	Arthritis Foundation	"Ease-of-Use Seal of Commendation" for the development of natural handwriting technology for use by disable people who have trouble with keyboard entry.
DuPont	1993	*Microwave & Rf* Magazine	One of the Top Products of 1993, for high-temperature superconductivity component technology.
Ebert Composites	1999	Civil Engineering Research Foundation	Charles Pankow Award for Innovation in Civil Engineering.
Engineering Animation	1994	*Computerworld Magazine*	Smithsonian Award for the use of information technology in the field of medicine.
Engineering Animation	1995	Association of Medical Illustrators	Association of Medical Illustrators Award of Excellence in Animation.
Engineering Animation	1995	International ANNIE Awards	Finalist, received jointly with Walt Disney, for best animations in the film industry.
Engineering Animation	1996	*Industry Week* Magazine	One of the 25 Technologies of the Year for interactive 3D visualization and dynamics software used for product development.
HelpMate Robotics	1997	*Discover* Magazine	One of 36 finalists for Technology of the Year for the HelpMate robot used in hospitals.
HelpMate Robotics	1997	Science Technology Foundation of Japan	Japan Prize to CEO Joseph Engelberger for "systems engineering for an artifactual environment."
Illinois Superconductor	1996	*Microwave & Rf* Magazine	One of the Top Products of 1996 for cellular phone site filters and superconducting ceramics.
Illinois Superconductor	1997	American Ceramic Society	Corporate Technical Achievement Award.
Integra Life Sciences	1999	New Jersey Research and Development Council	Thomas Alvin Edison Award to Dr. Kohn of Rutgers University for his collaborative work with Integra on the project.
Molecular Simulations	1996	*Computerworld Magazine*	Finalist for Smithsonian Award, the 1996 Innovator Medal.
NCMS	1994	Institute for Interconnecting & Packaging Electronics Circuits	Best Paper of Conference Awards.
Perceptron (formerly Autospect, Inc.)	1998	International Body Engineering Conference	Best Paper Award.
Strongwell Corporation	1998	Composite Fabricators Association Conference	Best of Show Award.
X-Ray Optical Systems (XOS)	1995	*R&D* Magazine	R&D top 100.
X-Ray Optical Systems (XOS)	1996	Photonics Spectra Magazine	Photonics Circle of Excellence Award.

Source: Advanced Technology Program First 100 Status Reports