

Shaping the future

Success stories from the CANARIE files





CANARIE: Making creativity work

It's no accident that Canadians are leading the revolution in advanced communications and information technology: the history of Canadian innovation is itself a shopping list of the very systems and devices that have changed and shaped the way we live and work. And the story continues. Across the country, in small towns and big cities, in university laboratories, high-rise offices and even in the humblest basement workshops, Canadians are redefining the information age.

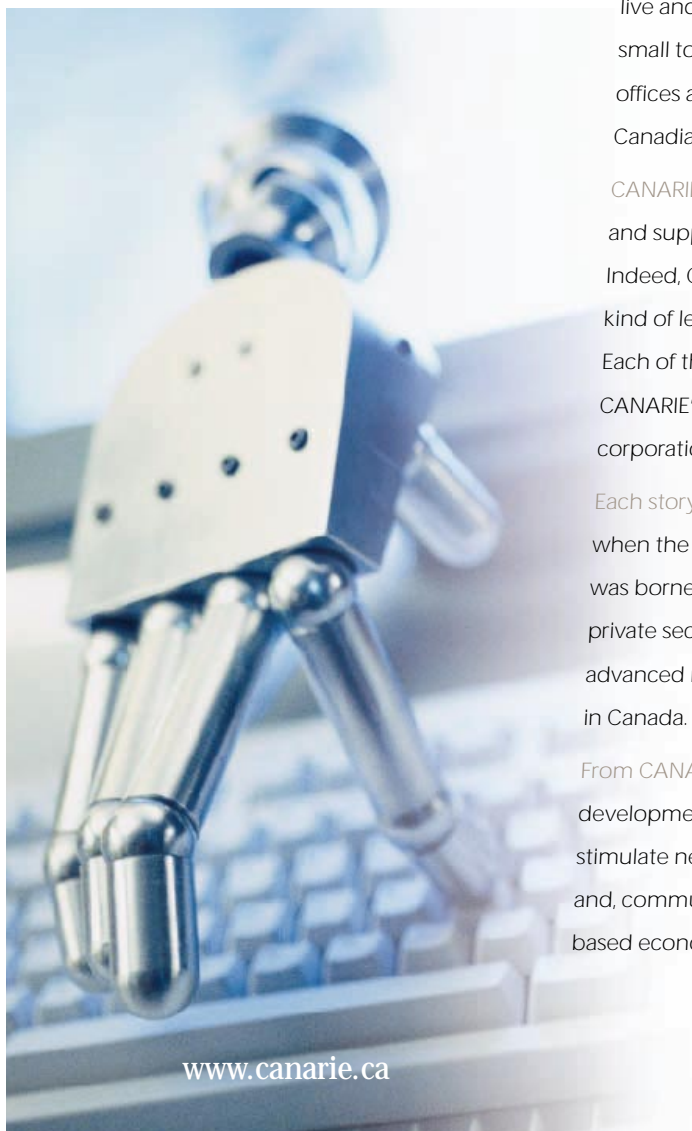
CANARIE is pleased to have the delightful task of helping to fund and support these creative and entrepreneurial Canadians. Indeed, CANARIE is proud to tell their stories, and celebrate the kind of leading-edge technologies CANARIE helps to develop. Each of the stories in this publication springs from the files of CANARIE's Applications Development Program, one of our corporation's three core programs.

Each story reflects the vision of CANARIE, a vision formed in 1993 when the not-for-profit corporation was created. Even its creation was borne of innovation: a way for the federal government and private sector to collaborate and stimulate the development of advanced networks and associated technologies and applications in Canada.

From CANARIE's creation sprang its mission: to facilitate the development of Canada's communications infrastructure; stimulate next generation products, applications and services; and, communicate the benefits of Canada's evolving knowledge-based economy and society.

Read on!

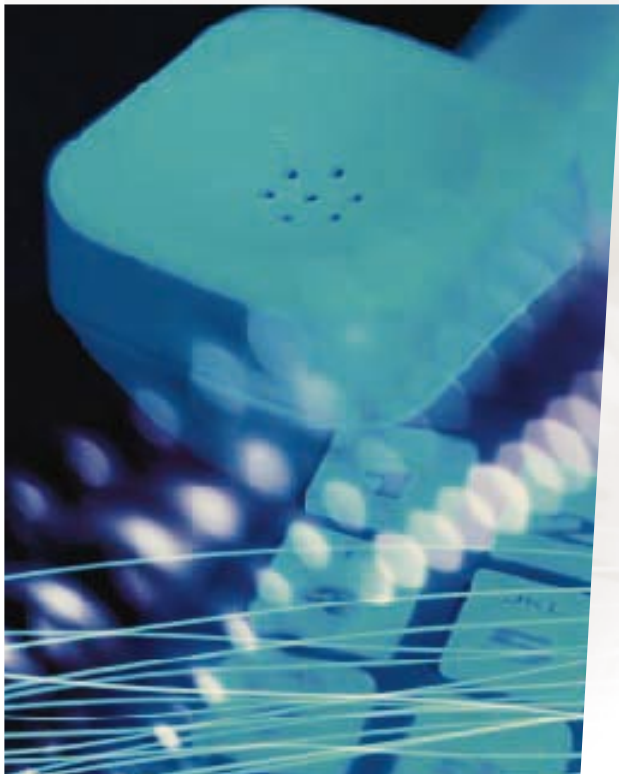
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Absolu Technologies Inc.

The Phone Booth of the Future

If Stéphan Lepage, president of Québec-based Absolu Technologies Inc. has his way, the good old phone booth will soon become a gateway to the Internet.



His company's new product—the TelWEB multimedia payphone — allows the public to browse the web using a colour touch-screen monitor, or send and receive e-mail messages and faxes. People can also use the terminal as a kiosk from which to access special services such as job banks, financial services, reserve ticketing, tourist info and classified ads. With an unlimited number of user interfaces, the multimedia payphone has the ability to offer different services depending on where it's located.

Developed in conjunction with QuebecTel, the Department of National Defence and CANARIE, this payphone of the future is of great interest to telecommunications companies who are upgrading their networks to accommodate the explosive growth of multimedia communications. Current clients include QuebecTel and NBTel. In fact, QuebecTel is implementing the world's first network of MultiMedia public phones.

The Multimedia payphone had its genesis in 1991 when the two co-founders were building business terminals with Bell Mobility Cellular. In 1995, with financial support from CANARIE, they started the TelWEB project, building the terminals on an Internet platform. By 1998, Lepage had created a small company with a big future in a market that's estimated at over \$3 billion.

"We knew that without CANARIE we would not be able to do the project. It was a big challenge with a big reward," says Lepage.

Absolu Technologies Inc. employs 17 people at its offices in Québec and achieved record sales of \$600,000 in the first quarter of 1998.



Shana Corporation

The Paperless Office is Back

Entrepreneurs at Shana Corporation are working hard to make paper a thing of the past. The \$2-million Edmonton company supplies electronic forms software to businesses and government departments in the United States, Australia and around the world.

With help from CANARIE, it has carved out a unique niche as the only forms software company in the world that allows users to design and fill in forms on both Windows and Macintosh operating systems.

In addition to its unique level of cross-platform functionality, Shana's Informed family of electronic forms products features a range of capabilities such as digital signatures, e-mail and a wide range of built-in intelligence. Other features include database connectivity and full Internet interactivity.

Shana's clients benefit from the greater efficiency and cost savings that electronic forms provide. Forms can be signed electronically, and then routed and tracked through an organization using e-mail, and submitted into a database or accounting system, all without ever going to paper.

The company was started in 1985 by two brothers, John and Don Murphy, and three other Macintosh software professionals. After creating the first electronic forms software for Macintosh computers, Shana developed the Informed product line, and applied for funding from CANARIE to develop a Windows version of the same product. With money from CANARIE, Shana was able to release the Macintosh and Windows version of the software at the same time.

Today, the company employs 27 people and is targeting major customers — from the Government of Australia to NASA.



HyperCore Technology Inc.

Turning Algorithms into Jobs

HyperCore Technology Inc. of Saskatoon has pioneered a low-cost, high-performance switching technology for an emerging multi-billion dollar worldwide market. At the same time, it has created exciting career prospects for homegrown computer science and engineering grads.

HyperCore is the first company in the world to develop an ATM switching prototype based on the Hypercube, an architecture developed at the University of Saskatchewan. The leading-edge features of the architecture include both a scalable design and inherent fault tolerance.

The company was created in 1995 with funding from CANARIE to begin developing the technology as a marketable product. Now, in 1998 Vancouver-based PMC Sierra has established an R&D facility in Saskatoon to continue the development and commercialization of HyperCore's technology, incorporating it into telecommunications switches sold around the world.

CANARIE's involvement in the project was instrumental — not only to get the company off the ground, but also to allow it to tap the local talent pool of Doctoral and Masters students before they move to other high-tech centres.

When the company started in 1995, there were three employees. That number grew to five by the end of the project in the fall of 1997, and their ranks are growing. Today, the Saskatoon facility employs nine engineers.

"We have a good school here at the University of Saskatchewan," says Joe Donlevy, former HyperCore president. "But, in the past, grads have pursued their careers elsewhere. HyperCore's success and the presence of the PMC Sierra Research facility will encourage students to pursue the type of training we require because they know they can work here."

"Hypercore is more than just a successful start-up. It has served as a powerful tool to entice young people to acquire the skills this region needs to compete in the global economy," he adds. "This could never have happened without CANARIE."

CANARIE — helping develop and fund leading-edge communications products and service applications for the global knowledge economy

Cifra Médical Inc.

The Doctor is On-line

With its ability to beam doctors into remote areas of the country, telemedicine captures the promise of the information age like few other high-speed networking applications.

Today, with funding from CANARIE, Cifra Médical Inc. is making that promise a reality for thousands of Canadians. The three-year-old Québec-based company is pioneering the development of a teleradiology service that permits doctors located at specialized centres to view diagnostic examinations being performed at another location. The doctors use the network to transmit x-rays, ultrasound and electrocardiogram images.

According to Cifra President, Jean-François Meunier, the telemedicine network saves money by creating a faster treatment cycle and cutting the costs of transportation and hospital stays. In Ontario alone, the total estimated cost savings amount to some \$500 million or three percent of the provincial health care budget.

Such results represent the initial pay off for CANARIE's early investment in the pioneering technology. The research consortium was the first investor in the fledgling company, providing seed money of about \$400,000. "Without that seed money, we probably wouldn't exist today," says Meunier.

Cifra Médical not only exists, it's thriving. The company has grown from 2 to 26 people and has already rolled out its telemedicine network to some 36 hospitals, mostly in Quebec. By year end, more than 50 of Canada's 600 hospitals are expected to be on-line.

And the future looks bright. Cifra Médical's next marketing wave will include the United States, where the telemedicine market is expected to exceed \$1 billion by the end of the century.



MicroForum Inc.
VITES Inc.
Développement Purkinje Inc./
Purkinje Inc.

University of Alberta
Tidal Photonics
HT Medical
CIFRA Médical Inc.

InfoMagnetics Technologies
Corporation
Province of Alberta Regional
Health Authority 15

Oracle Corporation
HyperActive New Media Inc.
Blackstone Multimedia Corporation
Mediatrux Peripherals Inc.

Cogeco Cable Canada Inc.
Information Sciences Group Inc.
Bell Québec
DISUS

Fuseworks Inc.
Groupe de recherches en
système d'information
Informar Marine Service Inc.

Carleton University
WurcNet Inc.
Synapse Holdings Inc.

Broadband Networks Inc.

Wireless Wave Lifts Winnipeg Company

Winnipeg engineer David Graves is an entrepreneur who saw the future clearly.

In March 1994, he started a company to manufacture leading-edge equipment for a market he believed was about to explode. He was right. In January 1998, Broadband Networks Inc. (BNI) — the company he started—was sold to Nortel for approximately \$585 million.

Today, BNI is a world-leading telecommunications equipment manufacturer with international sales efforts on all seven continents and a large ongoing recruitment effort in Winnipeg.

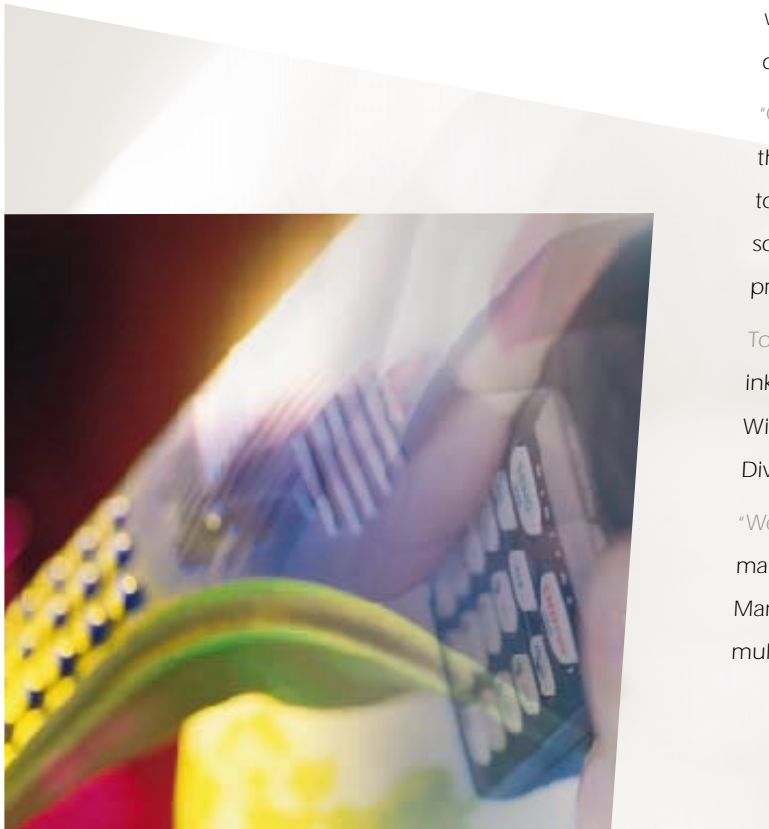
BNI's success was a case of knowing where the industry was going, being in the market with the right product at the right time, and a getting a little help from CANARIE. In this instance, the product was the Reunion family of network components for digital broadband wireless access services.

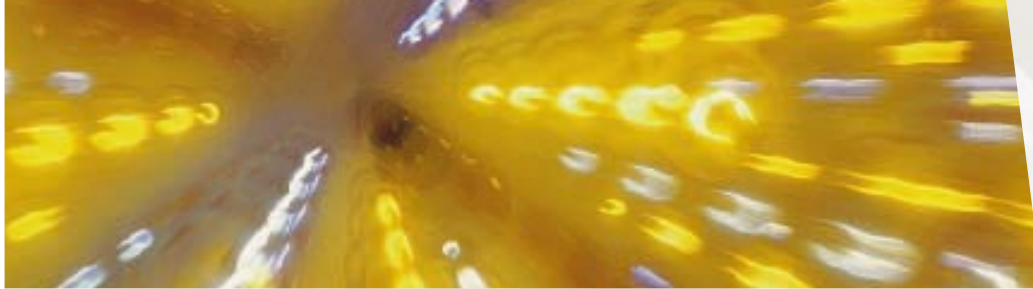
CANARIE funding allowed BNI to develop its technology at a critical stage in the company's growth. At a point when capital was hard to come by, the infusion of cash helped the company develop its new technologies.

"CANARIE was instrumental in supporting our research effort so that we could get to where we are today. We may have been able to do it without them, but their support allowed us to allocate some of the financial resources to other critical development projects," says BNI's Anthony Orlando.

Today, BNI is part of a much larger Canadian success story. After inking major contracts with U.S. companies such as Teligent and WinStar, the company is now operating as part of Nortel's Wireless Division.

"We're an R&D hungry company," says vice-president and general manager Rashid Skaf. "We draw on grads from the University of Manitoba and elsewhere to help us invent new products for a multi-billion dollar market."





Platform Computing Corporation **Platform Computing Launches a Rocket**

When Songnian Zhou, founder of Platform Computing Corporation, experienced success with his research at Northern Telecom in 1992, he decided to commercialize his creation.

It was a smart move. Today, the venture he started is a \$20-million company whose LSF (Load-sharing Facility) software is installed on about 60,000 computers in more than 600 major corporations around the world.

LSF software is a suite of products that allows users to harness all the computing power that exists on a network of UNIX or NT computers by letting the network act as a kind of virtual traffic cop. The solution saves users time and money and makes the most of all computing resources on a network.

Zhou and two others started the company on a shoestring back in 1992. After putting together \$200,000, they rented office space on College Street in Toronto and set about commercializing the technology. Within half a year, they had two big sales to Northern Telecom and Pratt & Whitney. The company was profitable in its first year of operation and every year since.

The LSF software was developed partially with funding from CANARIE. CANARIE's help accelerated Platform's research and development so the company could commercialize its product.

"Platform was a small, fragile company at the time it was given the funding," says Chief Executive Officer Dave Black. "The software would never have been developed as quickly without CANARIE's support."

Since then the company's revenues have doubled every year, climbing from approximately \$300,000 in 1993 to \$12 million in 1997. That remarkable growth has been supported by the company's expansion from 4 to 82 people.

Platform Computing will soon be introducing Version 3.2 of its software and has expanded its sales to the United States, Europe and Asia.

Strong, effective programs

Every dollar of taxpayers' money is matched by an equal or greater amount from the private sector.

Callisto Media Systems Inc.

Three men and a good idea

The company was named Callisto after one of the moons of Jupiter. And if shooting for the moon was a risk, it was well worth taking for Bruce Fischer, John Mavity and Yezdi Tamboli. Their product, a video server for video-on-demand services and based on unique architecture and software called Voyager, is going gangbusters.

The boys are on the move. Callisto has grown from the three partners in 1995 to eight to keep up with business demands. They're tripling their space and moving to another office in the National Capital Region.

Their story begins at Canadian Marconi Co., where the three were working in the early '90s. Marconi had received funding from CANARIE to help develop a video server with numerous educational, entertainment and medical applications. Eventually, however, the project was abandoned by Canadian Marconi.

The trio sensed an opportunity worth establishing a whole new company to explore. With CANARIE's direct involvement they secured the license to the intellectual property, formed their own company and continued to work on a project that may never have seen the light of day without CANARIE's support. "CANARIE was very patient while we got ourselves going," says Fischer.

Fischer and his partners have designed what is essentially a software VCR and a system in which to store, retrieve and manage broadcast-quality video, which can be called up through a private network onto computer screens.

Their product is now in the field, being tested in a number of high schools in the Ottawa area. Students can watch the video, stop, pause, or position the video just as one can on any VCR. The Voyager system allows them to learn at their own speed using innovative, high-tech methods.





The Esys Corporation

Ivy League e-mail

SIMEON is a Hebrew name meaning "he who is heard," and that name is indeed being heard loud and clear across Canada, the U.S. and Great Britain. SIMEON is a made-in-Canada, CANARIE-funded e-mail system—one so popular that it has been adopted by universities from the U.K. to California—Ivy League universities, including Harvard.

SIMEON, an Internet-based messaging system, is the invention of The Esys Corporation, an Edmonton company. Steve Hole, president and chief technical officer, came up with the idea and Grant Lakeman a 42-year-old entrepreneurial Albertan, recognized it was a great one and decided to support it.

So did CANARIE.

"The contribution was significant," says Marty Tascona, vice-president of sales and marketing for Esys, about CANARIE's involvement. Tascona, who completes the Esys triumvirate, says the company would have been in "dire straits" without the CANARIE funding.

Now, however, ESYS, which is happily paying royalties to CANARIE, is exporting \$4 to \$5 million of its product annually and has increased its staff from about 8 employees to 25. All this success in just three and a half years.

What sets SIMEON apart from other e-mail protocols is its unique access and mobility. For instance, physicians in hospitals can now quickly go to a kiosk on any floor of the hospital to check their e-mail, securely and simply. In other words, your e-mail and your entire suite of resources comes to you, you don't have to go back to your desk to access it.

A royalty payback scheme ensures a steady stream of new capital for reinvestment.

PacketWare Inc.

The Kitchen Network

There is no want of creativity in Cape Breton! Indeed, a recent innovation from a Sydney-based high-tech company is helping to secure Cape Breton's reputation as a player in the new wired world. The company is PacketWare. The innovation is a software application that can turn the most humble kitchen into a sophisticated Call Centre. JAVA-based, this latest development in remote-access technology is perfectly timed to meet the increasing demand for home-based office connectivity.

For instance, a mother could send her kids off to school in the morning, grab a coffee, sit down at her kitchen table and go to work, needing only an RF cable (the same kind as your cablevision connection uses), and a laptop to display a web page. Very little storage space is needed because all the data immediately flows in and out the cable wired into the home. PacketWare's Murray Heggie says the company is three-quarters of its way through the project and will be testing the system this summer.

"It's a great application for a region like ours," says Heggie.

The idea for this application grew from an earlier project also funded by CANARIE. CANARIE then made a decision, a prescient one it turns out, to continue to fund a subsequent project that could salvage the valuable intellectual property of the former.

"CANARIE was the first to give us a serious hearing," says Heggie. "We knew that they fund leading-edge network applications. We didn't have the capital to push ahead with our development project. CANARIE helped us through a difficult period."

It could be helping Cape Breton through one as well. Heggie's company staff has grown from 6 to 20 in just two years and now pays salaries of \$40,000—about twice the average annual salary in Cape Breton.





NBTel InterActive

Distance makes the heart grow stronger

In his 25 years with New Brunswick's phone company, Alden Parker has done everything from sales to product management, and he's loved it all. His latest project involves leading-edge, interactive technology that goes right to the heart. Parker, of NBTel InterActive, is working on a system that will allow cardiac patients from every part of New Brunswick access to critical health care right in their own communities, and in some cases their own homes.

The key is VITAL (Virtual Interactive Telehealth Assisted Link) — a two-way audio visual link of such high quality that a heart specialist at the province's only cardiac centre in Saint John can clearly see if a cardiac patient's wound is red or swollen, even when the patient is sitting 350 km away in Bathurst.

The system performs regular tests and checks such as blood pressure, and can transmit ECG information with guaranteed privacy. It means less travel and upheaval for cardiac patients, better use of specialists' time and a more cost-efficient health system.

Parker recognized the need for such a system while working closely with Atlantic Health Sciences Corporation in Saint John, N.B. They recognized the need for a strategic alliance to bring this innovative but expensive \$3 million-telehealth product to the marketplace. Together, Parker's NBTel InterActive, a division of NBTel, and the Saint John hospital corporation approached CANARIE as a funding partner.

"We were very fortunate to receive funding," says Parker.

"CANARIE gave us the jumpstart to go to other organizations to seek financial support. They were the first in, and the catalyst that allowed us to move forward."

Moving forward they are! Parker says installation of test units for hospital and home will be carried out through the summer and into the fall. But the system is a guaranteed winner; in addition to its impressive features, Parker made sure it has a great bedside manner.

CANARIE — creating strategic alliances between growing high-tech companies and the established players

Nautical Data International Inc.

Charting Success

It's the media darling of Newfoundland, this young company that took unemployed fishermen and fishplant workers and transformed them into computer experts.

Nautical Data International was started in St. John's in 1993 by Brian Terry, a math grad from Memorial and McGill. His idea was to establish a company to benefit from the maritime know-how of Newfoundlanders in the age of digital communications. It worked. Five years later, NDI has 64 employees, 30 of whom are former fisheries workers.

"I recognized an opportunity and did something about it," says 44-year-old Terry. "As Thomas Edison said, many people don't recognize opportunities when they're dressed in work clothes."

Working with Fisheries and Oceans Canadian Hydrographic Service (CHS) and other hydrographic offices, NDI produces and distributes Electronic Charts — digital versions of the paper navigational charts traditionally used by sailors. New and exciting uses have recently been identified. Indeed, the company helped an East coast scallop fishery become more efficient by using a new charting product based on multi-beam sonar surveying data that actually provides a 3-D representation of the ocean floor. It identified the best areas to find those scallops.

Terry figures he will sell about \$2 million of data this year, to commercial and recreational interests. He says he couldn't have done this without CANARIE's involvement in two projects that allowed NDI to build a research and development team. NDI has even begun to pay back CANARIE's investment.

Meanwhile, Terry continues to add to his scrapbook of press clippings. *The Vancouver Sun*, *The Globe and Mail* and *The Washington Post* are just some of the newspapers who have recently written about NDI's success.



Dimension 4 Multimedia Inc.
National Research Council of Canada
Nautical Data International Inc.

Centre national d'animation
et de design
Canada Centre for Remote Sensing
Base4 Bioinformatics

Carleton University
Riisearch DataLynx Inc.
Telexis Corporation
GECKO Electronique Inc.

Telecommunications
Research Laboratories
Mortice Kern Systems Inc.
LM Soft

Hypercomp Inc.
Island Tel Advanced Solutions
PEI Department of Education
Ice Centre of Environment Canada

Object Form Inc.
Smart Toronto Advanced
Communications Initiatives Inc.
Eastern College

The University of Western Ontario,
the London and Area Regional
and Global Network
SaskTel

Lakehead Uni
Hughes Cana
Support DI
Cableshare Int



Miranda Technologies Inc.

All that Jazz

You've heard the story before. Small company. Great idea. No money for research. That was Montreal's Miranda Technologies Inc. several years ago. Miranda went for funding from CANARIE, got it and is beginning to pay it back.

The idea was that advertising agencies, film studios and post-production facilities should be able to work collaboratively on the same project, at the same time, while in different cities. Miranda and its partners believed that a post-production facility, for instance, should be able to receive rushes from remote film locations in a matter of minutes. And editors should be able to edit or render special effects without having to wait for overnight couriers or mail trucks. So they got to work.

The result of their efforts is a system currently being commercialized by the Jazz Media Network. The Jazz Network creates a shared digital work environment across a broadband connection. And it works — in its first 60 days on the market Jazz signed up 11 companies in Los Angeles, Toronto and Montreal.

Miranda's Christian Tremblay says his company could not have been involved in the project without CANARIE's help. It allowed Miranda money for research and development and, in turn, attracted the attention of Bell Canada. A partnership was formed. Miranda provided the hardware; the software came from Bell.

Last year Miranda secured more than \$13 million worth of business, recorded significant profits and increased staff from 50 to 80 people.

CANARIE funds results

- Close to 200 projects involving 500 Canadian companies funded
- Average of 30 percent of total project costs funded by CANARIE for total investment of \$60 million
- Combined public and private sector investment nearly \$200 million
- Some 10 full-time, highly-skilled technical jobs created per project
- As many as five full-time marketing, sales and administration jobs created per project
- Approximately 2250 jobs created since 1995

Atlantis Aerospace Corporation

A Successful Diagnosis

An aircraft mechanic armed with nothing else but a laptop computer can have a sick plane diagnosed within minutes using a database system called SpotLight. Developed by Brampton-based Atlantis Aerospace Corporation, SpotLight is a case-based reasoning and diagnostic tool for the aircraft industry.

This is how it works: a mechanic can enter several key symptoms into the system. SpotLight asks questions, leading the mechanic to a possible solution based on a broad spectrum of actual cases contained in its impressive database. The diagnosis can be almost immediate.

SpotLight, which recently won Aviation Week's prestigious Technology Innovation Award, is being tested by several major aircraft companies. Even skeptical mechanics are impressed. It's also an application that could be broadened to include the health field.

SpotLight was the brainchild of a team headed by Phil D'Eon, a former aircraft mechanic who at 26 decided to start his own company, Atlantis. That was 20 years ago. D'Eon began working full-tilt on SpotLight about two years ago, after identifying a pressing need in the industry to communicate this sort of knowledge among mechanics. So pressing is that need that D'Eon has spun off a new company, called CaseBank Support Systems, to deal with the successes and commercialization of SpotLight. He estimates it will grow from 22 employees, who are earning over \$50,000 a year on average, to nearly 200 in five years. "Without CANARIE there was no way the project would have gone ahead," says D'Eon. "It was a significant reach for us to do this. The venture capital community would not step up. It was too early."





SoftQuad Inc.

An Accessible Web

Yuri Rubinsky, one of the founders of Toronto's SoftQuad Inc., had been a strong advocate for access for the disabled to the World Wide Web. When he died suddenly and tragically at age 44 in 1996, he left behind an unfinished masterpiece — a web-authoring tool for the disabled.

"The web is about broad, wide participation. Why should it exclude people with disabilities?," says Roberto Drassinower, the 34-year-old general manager of SoftQuad Inc., and an enthusiastic advocate of Rubinsky's philosophy.

With CANARIE's help the masterpiece, an adaptation of SoftQuad's internationally acclaimed HotMetal product, is now finished. Teamed with Jutta Treviranus, head of the University of Toronto's Adaptive Technology Resource Centre and CANARIE, SoftQuad incorporated an on-screen keyboard and text-to-speech capability into HotMetal. It also allows any designer to create and test the accessibility of web pages for the disabled.

CANARIE's contribution was critical, providing SoftQuad the initial money to move forward with development. Launched last August, the product is selling around the world. Some 60,000 units have sold so far.

Sadly, Rubinsky never saw the results of his work. Two years after he died, SoftQuad won a prestigious award from the American Federation for the Blind. His friends have continued his fight for accessibility through the Yuri Rubinsky Insight Foundation. Information about the foundation is easily accessible on the web at www.yuri.org.