Pilot Project BlueBear

Project Summary

Forward

Project BlueBear involved the deployment, testing and evaluation of the world's first distributed search engine that used face recognition technology and textual records to securely and simultaneously search and share information among multiple, *linked,* police mug shot databases and text records systems. The technology *now* named Integrated Digital Law Enforcement (IDLE) was designed to respond to worldwide police and integrated justice requirements for the timely and effective administration of justice, including information search and sharing initiatives.

IDLE built to international common criteria standards, was created after extensive police testing, evaluation, and market research which resulted from Pilot Project BlueBear. IDLE is now being deployed in Canada by BlueBear Network Canada Inc. (www.bbncanada.com)

VisionSphere Technologies
Feb 2005

CPRC

Canadian Police
Research Centre

CCRP

Centre canadien de
recherches policières

1/31/2005

Mr. Sal Khan, President
Visionsphere Technologies Inc.
260 Hearst Way, Suite 311
Kanata, ON K2L 3H1

Dear Mr. Khan,

RE: Project BlueBear - a successful CPRC sponsored project

I am taking this opportunity to thank you personally for your leadership in the Project BlueBear project. Your participation and ability to innovate 'on-the-fly' added enormous value to the project. Nothing makes success like enthusiastic hard work! As you know much went into the making of the project where we went from the birth of the idea at the 'CPRC Technology Showcase' to implementation of the project in three Ontario Police Services - Chatham-Kent, York and Windsor.

The introduction of facial recognition technology was accomplished when the project's first objective was successfully completed with the delivery of the stand alone (not connected to a police service LAN) at end of 2003.

As you know, the final phase of the project now completed where the the BlueBear search and information sharing engine was installed on a police local area network. With BlueBear achieving CPIC services compliance it is now possible to deploy on a local police LAN. This enables them the ability to securely use the Internet to search and share their information. This ability to share resulted in a major success in the final phase of the project when from Chatham-Kent, there was an identification of a suspect whose mug shot and thus his identification was found in the York Regional Police database. This search took 7 seconds! In this case the scanned facial image was taken from a fraudulent Permanent Resident Card, left behind by the suspect when he fled from a bank.

This project underlines the need for CPRC to continue to support Canadian industry in the development of their ideas and eventual products for the benefit of the police community and the public they serve. Without commitment and resolve on all sides, government, industry and the police project's like BlueBear would not success.

Again, thank you for your participation and wish you and your company much future success.

Yours truly,

John Arnold, Chief Scientist
Canadian Police Research Centre

CPRC - TR-001-04
Pilot Project BlueBear

Evaluation Report

Canadian Police Research Centre

VisionSphere Technologies Inc.

and

March 2004

EXECUTIVE SUMMARY

"On November 27, 2003, a man was arrested and officers questioned his identity. Rae Morrell, head of Chatham-Kent Police Service's forensic identification unit photographed the individual and ran the individual's facial template through three police service mug-shot databases. A match was found in York Regional's database; it took 11 seconds"

The attached is the BlueBear evaluation report, a collaborative project between the Canadian Police Research Centre, VisionSphere Technologies Inc. and three Ontario municipal police agencies - Chatham-Kent, York Region and Windsor.

The project was very successful as it met and exceeded all our expectations and objectives. The following lessons learned underline this success:

1.   Participants agreed that the best uses for facial identification technology within a Police Forensic Identification environment were, to confirm the identity of a suspect prior to booking, to identify facial images extracted from video surveillance systems, and to create a facial image "suspect" database.

2.   The distributed secure searches of mugshot and text databases were accomplished over the Internet making this approach cost tolerant and efficient.

3.   All agreed that the BlueBear system would be even more effective linked to larger and more police mugshot systems.

4.   It was suggested that it would be more convenient and significantly easier to keep databases up to date by having the VS-Ident server connected to individual Arrest and Booking Systems.   This has been resolved at Chatham-Kent.

5.   The BlueBear technology was installed at the Chatham-Kent courthouse to screen suspected visitors.

6.   Providing digital fingerprint services with facial identification technology would make the solution more complete. (VisionSphere as an extension of Pilot Project BlueBear will deploy on a trial basis, an AFIS quality, high-resolution, 10-print finger scanner at Chatham-Kent Police Service, in the second quarter of 2004.

Pilot Project BlueBear demonstrated that electronic mug-shot searches, distributed across multiple police services, is an effective tool in identifying suspects and offenders. This Canadian built technology, using facial identification, secure distributed search and information-sharing software, which is now able to provide linkages to Provincial and Federal criminal justice databases, can be a strong step forward in the ongoing effort to provide our police services with the right tools to make our cities and provinces safer places to work and live.

We would be remiss if we did not underline that the success in this project rested with VisionSphere and its CEO, Sal Khan. Without Mr. Khan's dedication and perseverance this project would not have realized this success.

RÉSUMÉ

« Le 27 novembre 2003, un homme est arrêté et les agents de police se posent des questions sur son identité. Rae Morrell, chef de l'Identité judiciaire du Service de police de Chatham-Kent photographie l'individu et consulte les bases de données de photographies signalétiques de trois services de police pour y comparer les données biométriques faciales de l'individu. Onze secondes plus tard, il obtient une correspondance dans la base de données du Service de police régionale de York. »

Voici le rapport d'évaluation BlueBear, un projet de collaboration entre le Centre canadien de recherches policières, VisionSphere Technologies Inc. et trois services de police municipaux de l'Ontario - Chatham-Kent, région de York et Windsor.

Le projet a connu un vif succès. Il a non seulement répondu à toutes nos attentes et atteint tous nos objectifs, il les a même dépassés. Les enseignements que nous en avons tirés soulignent ce succès :

1. Les participants ont tous admis que le recours à la technologie de reconnaissance des visages dans le milieu de l'identité judiciaire convenait très bien aux activités suivantes : confirmation de l'identité d'un suspect avant sa mise en détention, identification des photographies de visages extraites des systèmes de surveillance vidéo, et création d'une base de données de photographies de « suspects ».

2. Les recherches protégées et réparties dans les bases de données de photographies signalétiques et de textes ont été effectuées par le bais d'Internet, donc une approche économique et efficace.

3. Tous s'entendent pour affirmer que le système BlueBear serait encore plus efficace s'il était relié à de plus gros et plus nombreux systèmes policiers de photographies signalétiques.

4. On a mentionné qu'il serait plus pratique et beaucoup plus facile de tenir à jour les bases de données si le serveur de VS-Ident était branché aux systèmes individuels d'arrestation et de mise en détention. C'est ce qu'on a essayé de faire à Chatham-Kent.

5. La technologie BlueBear a été installée au palais de justice de Chatham-Kent pour le triage des visiteurs suspects.

6. L'offre de services de dactyloscopie numériques alliée à la technologie de l'identification physionomique rendrait le solution plus complète (dans le cadre du prolongement du projet pilote BlueBear, au cours du deuxième trimestre de 2004, VisionSphere mettra à l'essai un lecteur d'empreintes digitales à dix clichés, à haute résolution et d'un niveau de qualité AFIS (système informatisé de dactyloscopie), au Service de police de Chatham-Kent).

Le projet pilote BlueBear a démontré que les recherches dans des bases de données électroniques de photographies signalétiques qui sont réparties au sein de nombreux services de police est un outil efficace pour l'identification des suspects et des contrevenants. Cette technologie canadienne, qui utilise un logiciel de recherche et de partage de l'information

répartis et protégés et repose sur l'identification physionomique, fournit maintenant des liens avec les bases de données des systèmes de justice pénale provinciaux et fédéraux. Elle peut donc s'avérer un pas énorme dans l'effort continu déployé en vue de fournir à nos services de police les outils adéquats pour faire de nos villes et de nos provinces des endroits encore plus sécuritaires, où il fait bon travailler et vivre.

Le CCRP ferait preuve de négligence si nous ne soulignions pas le fait que la réussite de ce projet incombe à VisionSphere et son pdg, Sal Khan. Sans le dévouement et la persévérance de M. Khan, ce projet n'aurait pas connu un tel succès.

INTRODUCTION

The law enforcement/criminal justice community relies on the sharing of information to authenticate the identity of criminals and suspects. The reality is, however, that police services are not always able to share critical information with each other, and the process is often slow. On November 30, 2003, VisionSphere Technologies (VST) Inc. and the Canadian Police Research Centre (CPRC) successfully completed Pilot Project BlueBear, demonstrating that electronic mug shot databases and textual data of different police services can be shared easily, reliably, simultaneously, and securely, using existing IT infrastructure.

Announced in June 2002, Pilot Project BlueBear would permit participating police services to perform electronic searches of each other's digital mug shot systems by deploying, testing, and evaluating, VST's *VS-Ident*—secure, distributed, information search and sharing technology, integrated with VST's secure, Internet-based, biometric and textual search engine.

Three Ontario police services—Chatham-Kent, York, and Windsor—participated in the project, which consisted of two phases. The first phase involved the installation of a stand-alone version of *VS-Ident*, which enabled participants to become familiar with the technology, to convert their digital mug-shot databases to biometric facial template databases, and to search their own database. The second phase started in May 2003 linking the databases of the three police services over the Internet, giving the police services the ability to simultaneously search each other's mug shot and textual databases. This phase involved recording search results over four months, beginning in August 2003.

Research Results
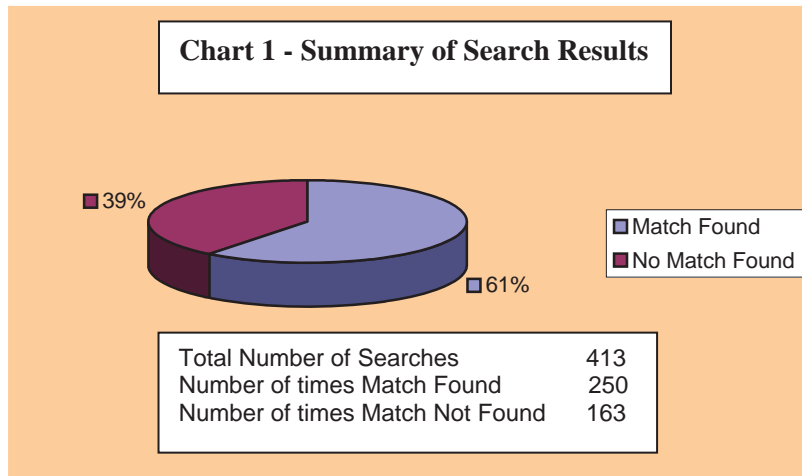
There were approximately 118,000 mug shot records residing in the participating databases. The summarized search results are shown in Chart 1.

Chart 1 - Summary of Search Results

- 39% No Match Found
- 61% Match Found

Total Number of Searches	413
Number of times Match Found	250
Number of times Match Not Found	163

All involved in the project reported Pilot Project BlueBear was successful. Half of all the searches performed *found matches* in the case of York, and *two/thirds* in the case of Chatham-Kent. In cases where matches were found, a large majority were found within the first ten search results displayed – 83% for York and 75% for Chatham-Kent, making it easy for the operator to find the correct record. The system performed searches rapidly, searching and sharing information in 7 to 14 seconds from the three separate databases. According to the participants, the system was *easy to use* and required *a short training period* in order to become familiar with the technology.

Successes

Individuals were correctly identified using a wide variety of sources including an image from a video surveillance tape; mug shots from other police services submitted on paper; cropped facial image from 35mm photograph; slightly turned-down face from a bank-robbery video; and composite drawings. Matches could be found even where the subject went from long hair to bald in 5 years.

At the Chatham-Kent Police Service, late in the evening on November 27, 2003, a man was arrested and officers were not certain of his identity. Using *VS-Ident*, officers were able to positively identify the individual based on a mug shot in the database of York Regional, it took 11 seconds.

Lessons Learned

Participants agreed that the use of electronic searches was useful in identifying suspects and offenders. All agreed that the tools would be even more effective with larger and more, linked police databases. In addition, participants suggested that it would be more convenient and significantly easier to keep databases up to date by having the *VS-Ident* server connect to individual Arrest and Booking Systems. This problem is being addressed. At the March 2004 meeting, the **CPIC Triumvirate,** approved a request from Chatham-Kent Police Service to install VisionSphere's distributed search and information sharing system linked to Chatham-Kent's local area network (LAN), which is connected to CPIC via GONet, and shares information with the York and Windsor, *VS-Ident* data search servers.

The participants felt that the three best uses for facial identification technology within a Police Forensic Identification environment were, to confirm the identity of a suspect prior to booking, to identify facial images extracted from video surveillance systems, and to create distributed facial image "suspect" databases.

As a result of viewing the *VS-Ident* technology at Chatham-Kent, the head of court security at the Chatham courthouse had the system installed at the courthouse, in November 2003.

Expanding the scope of the product to include access to Provincial criminal justice information databases, such as, Offender Tracking Information System (OTIS); Integrated Court Offences Network (ICON); Justice Information System (JUSTIN); Canadian Police Information Centre (CPIC); and Real-Time Identification (RTID) would benefit public safety. The next release of the VS-Ident product and the recent approval from the CPIC Triumvirate will make such linkages available.

During the Pilot Project, it became apparent that providing digital fingerprint services would make the solution much more complete. As an extension of Pilot Project BlueBear, VisionSphere will deploy on a trial basis, a high-resolution, 10-print finger scanner at Chatham-Kent Police Service. This facility will include the ability to submit fingerprints electronically to the RCMP. An Automated Fingerprint Identification System including palm print identification will be added as the technology is deployed commercially.

Pilot Project BlueBear demonstrated that electronic mug shot searches, distributed across multiple police services is an effective tool in identifying suspects and offenders. This Canadian built technology, using facial identification, electronic fingerprint searches and linkages to other criminal justice databases can be a strong step forward in the ongoing effort to provide our police services with the right tools to make our cities and provinces safer places to work and live.

Background

Many organizations in the law enforcement/criminal justice community rely on the sharing of information to authenticate the identity of individuals. The reality is, however, that police services are not always able to share critical information with each other, and, in many cases, the process is slow. In April 2002, Greg Wright, the executive director of the Integrated Justice Information Secretariat, of the Department of the Solicitor General of Canada, was speaking about a Canadian Public Safety Information Network (CPSIN), which he described as "a network of networks," in which partners are given "a national criminal justice information sharing capability." The announcement caught the attention of VisionSphere Technologies (VST) Inc., because VST was, at that time, developing information-sharing technology that "aligned" with the concept of a Canadian Public Safety Information Network. The Company was also preparing, under the sponsorship of the Canadian Police Research Centre (CPRC), to begin a pilot project that would introduce and test its information search, and sharing technology in a law-enforcement environment.

Pilot Project BlueBear - a Public Private Partnership

In June 2002, VisionSphere Technologies (VST) Inc. and the Canadian Police Research Centre announced the introduction of Pilot Project BlueBear to members of the Canadian law enforcement community.

The purpose of the pilot project was to have participating police services deploy, test, evaluate, and provide a written report to the CPRC on Project BlueBear and its technology, *VS-Ident*—secure distributed networked search technology integrated with VST's face-recognition search engine. This technology facilitates the integration of information systems within the criminal justice community and the quick sharing of information among members of that community, via the Internet, in a highly secure environment using existing IT infrastructure.

Speaking at the announcement, John Arnold, Chief Scientist for the CPRC, noted that the pilot is probably one of CPRC's most ambitious projects to date. He underlined that "the events of 9-11 clearly demonstrate the need for police services on both sides of the border to share information in a more timely and cost-effective way."

Three police services—Chatham-Kent, York, and Windsor—participated in the project. The first phase of the project involved the installation of a stand-alone version of *VS-Ident*, which enabled participants to become familiar with the technology, to convert their digital mug-shot databases to facial-recognition templates, and to search their own template databases. During the second phase, which began in May 2003, the databases of the three police services were linked, over the Internet, giving them the ability to simultaneously search each other's mug shot and textual databases (see Results, below). This phase involved recording search results over a minimum of three months, beginning in August.

Project supporters include the Canadian Police Research Centre, the National Research Council, the Canadian Association of Chiefs of Police, the Ontario Police Technology Information Cooperative, and the Integrated Justice Information Secretariat - IJIS, Public Safety and Emergency Preparedness Canada. The IJIS is a federal government initiative aimed at enhancing the sharing of information among federal, provincial, and territorial criminal justice partners in Canada. The IJIS and its partners are involved in creating the Canadian Public Safety Information Network, which will optimize information sharing among criminal justice partners.

The IJI Secretariat states "it has been encouraging the advancement of Project BlueBear, recognizing the need for police to be able to easily share mug-shot photos across Canada. Project BlueBear's facial

recognition technology provides the added dimension of being able to use photos, videos and composite images to help solve crimes and identify known criminals."

Sun Microsystems Canada, a partner in the pilot, provided technical assistance in porting applications over to Linux and Solaris, as well as Sun LX 50 servers and a Sun Blade server, running on Solaris, that plays the core role of "Network Guardian," providing users with a high level of security when accessing the network.

Information Builders Inc., also a project partner, provided and installed its iWay software, and its adapter technology to create a more cost- and time-effective process for downloading mug shots and text data from the police services' arrest and booking systems to *VS-Ident*. Also, VisionSphere and iWay standardized the format of data being transferred to ensure consistency and reliability of the information being shared. Consistency will be accomplished by using the Data Dictionary, published in November 2002, by the Data Standards Secretariat of the Solicitor General Canada.

Compaq/HP Canada, also a partner in the pilot, provided Compaq workstation to participating Police Services for the duration of the pilot.

Although the 3 Police Services are still using the VS-Ident technology, the Pilot Project officially ended on December 31, 2003.

Project Composition

Project BlueBear Configuration
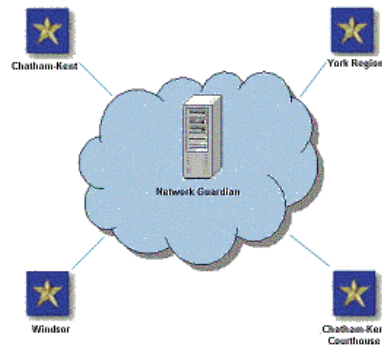
Results

The results of searches, using the *VS-Ident* technology, are available for Chatham-Kent Police Service and York Regional Police Services. Only the mug-shot database of Windsor Police Service, which was the last to come on line (August 13, 2003), was available to be searched. No search statistics are available for Windsor Police Service as it was unable to fully use the technology; data could not be transposed from Windsor's arrest and booking system (ABS) due to lack of cooperation from the ABS provider. There are approximately 118,000 mug shots residing in the 3 databases.

While the majority of searches were distributed, i.e., the 3 databases were searched securely and simultaneously, some searches were undertaken only on the local server residing with the individual police service. Many of the searches were conducted, using old mug shots.

There are several situations that could account for a match not being found within the three mug-shot databases: the suspect had no prior record and therefore a photograph/mug shot does not exist for him/her; a mug shot does exist but resides in the mug-shot database of another police service not participating in the Pilot Project; and the poor quality of the facial image/photo (for example, very poor lighting, dark shadows on face, partial as opposed to full face image, and in the case of an image taken from a video-surveillance tape, the image is too small, blurry/fuzzy, etc.).

Since there isn't any way to know whether a suspect's mug-shot and arrest record are in a Police Service's arrest and booking database, it is therefore not always possible to determine exactly why a mug shot search did not find a match.

York Regional Police Service - Search Statistics

Statistics for York Regional Police Service cover the period August 11 to December 15, 2003. Data was gathered from both a manually-generated log as well as an automated log, a feature of the software, that allows the user to enter search performance characteristics (type of search, type of image used, rank of most similar image) and other pertinent information such as date, user ID, comments on search performance.

The majority of the 168 searches documented were distributed; most of the images were full-face and real photographs. In two instances, searches were not possible because of the poor quality of the photos. Of the 168 searches, 20 images were taken from surveillance tapes and could not be searched because of the poor quality of the images. On average, distributed searches were conducted in 7 to 14 seconds, and the matched facial images downloaded over the Internet, usually in less than 30 seconds. *VS-Ident* is located and used in the Ident office only; i.e., it will be available at the booking station for live suspect searches over York's LAN, in the next phase of the project.

Table 1, below, provides information on all the searches with the exclusion of the 20 images that were unsearchable.

Table 1 – Information on searches conducted by York Regional Police Service

				Input images	Performance characteristics
Total number of searches	148	**Match found**	73	Old mug shots New mug shots Composites Crime scene (photos, video surveillance tape)	- See Table 2, below, for details.

	No match found	75	Old mug shots New mug shots Composites Crime scene (photos, video surveillance tape)	- There were four cases for which it was believed that corresponding matches were in the searched databases. - Some notations indicated the subjects were believed to have been booked by other police services and that being able to search their databases would have beneficial.

Table 2 – Detailed information for matches found

IMAGE TYPE	Total number of searches	Match found	Match not found	Match found within first 10 search results displayed	Match found within search results with rank greater than 10
Old mug shots	39	13	26	11	2
New mug shots	73	58	15	48	10
Composites	14	1	13	0	1
Crime scene	22	1	21	1	0
Total	**148**	**73**	**75**	**60**	**13**

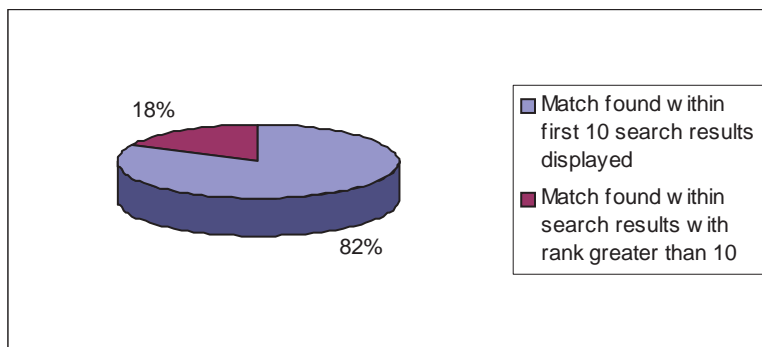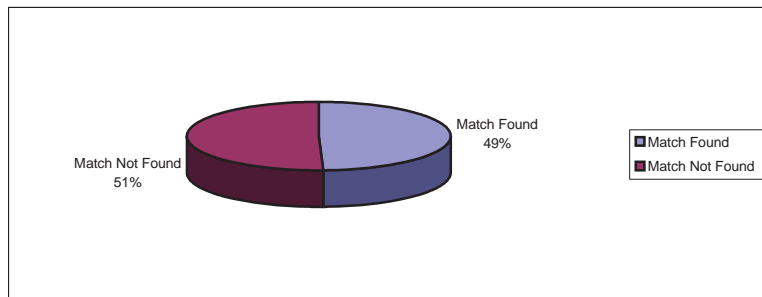*Chart 2 – York Regional search results*

Chart 3 – York Regional rank results

York Regional search highlights

- Using a composite, York's database was searched; the suspect was located, in # 17 position.

- An image from a video surveillance tape resulted in a suspect being found in York's database (position # 4); when the search was conducted in the 3 databases, the suspect was located in # 8 position.

- Using 8 different images of the suspect and searching in the three databases, various images of the suspect were located: on pages 1, 11, and 17 (each page contains 12 images).

Comments Detective Sergeant David Juck of the York Regional Police Service

The facial recognition experiment in co-operation with John Arnold of The Canadian Police Research Center and Sal Khan of VisionSphere Technologies was successful. Of the 168 searches we preformed *half found matches.* The search system lived up to its claims of *extreme speed* as it shared information quickly, from 7 to 14 seconds from three separate databases. The system is *easy to use* and requires a short training period in order to become familiar with the technology.

- It would have been more advantageous if more agencies were involved in the project. I do however understand why other services were reluctant to participate in the implementation and testing of the technology, as it was time consuming for me and involved legal agreements, information technology section participation, special CPIC permission, continuous mug shot removals from the data base re: internal and external record destruction maintenance, and finally, there was no assistance from our mug shot provider.

- The involvement of a point person in our case was York Regional Police Detective Constable Sean Fitzgerald, who was key to the thorough testing of the product. I feel the extra effort and experimentation was worth discovering *VS-Idents* effectiveness as *another search tool* for the apprehension of criminals. The system "***makes better use of any mug shot data base.***"

- Additional *aging software* available from VisionSphere in the Summer 2004 is of particular interest for its potential regarding missing person and abduction cases.

- Old mug shot searches - Images were retrieved from black and white and colour negatives, scanned, and saved onto a CD. These mug shots were obtained during the time period of 1974 to 1992. Not all subjects were facing the camera straight on, which may have affected the results.

- For this type of search technology to succeed nationally it would take the co-operation of all Police Services sharing their mug shot data banks, this is easier said then done. Unfortunately I do not see this happening any time soon. I do however envision local and regional co-operation in this venture pending reasonable operating costs.

- York's participation in this facial recognition technology project enabled us to explore its practicality within our own environment;
  (a) as an *additional suspect search tool* for the forensic office,
  (b) assist our *investigative units* who may only have a photograph, digital image, video image or composite of a wanted person or persons of interest, and require a timely, and accurate mug shot search,
  (c) potential for creating a *most wanted library* of; national and international criminals and terrorists,
  (d) persons flagged by York Regional Police as potential threats to our members, or the public.
  (e) in addition to livescan, VS-Ident is a local internal flagging tool for fingerprint processor booking stations for those suspects and offenders that:
    - fail to appear for fingerprinting
    - fail to appear DNA orders

- o   fast identity search by police (initial contact identity problems) prior to fingerprinting.
- o   local warrants flagged in biometric and records databases maintained by York Regional
- York Regional Police command staff progressively supported the experimentation of this emerging technology. Assistance in implementing the project was also provided by Information Technology Services, and Regional Legal Services. Without their assistance we would never have had this unique opportunity to share this cutting edge technology with our partners, Chatham-Kent and Windsor.

Concerns

- *Composite searches* revealed only 1 hit after 14 separate searches at York. The future potential of captured suspect video images will continue to be an issue due to poor video images. Without clear frontal facial illumination it is difficult to search the database.
- The general *quality of incoming video surveillance tape* and overall *camera positions* are responsible for the poor showing of the recorded data. With the introduction of digital video surveillance cameras in the marketplace, the quality of newer video surveillance images has improved, and this should lead to more positive identification of facial images extracted from video surveillance systems.
- *Positioning of the red dots on the eyes* can affect the search results, searching with different positions can have different results. Additional tool needs to be developed within the system which could automatically alter eyes to *next best search position.*

Chatham-Kent Police Service - Search Statistics

Statistics for CKPS cover the period August to December 2003. They were gathered automatically through a feature of the software—a data log—that allows the user to enter search performance characteristics (e.g., type of search, type of image used, rank of most similar image) and other pertinent information (e.g., date, user ID, comments on search performance).

A total of 279 searches were performed of which 265 were distributed.

The majority of the input images were full face (as opposed to partial) and real photos (as opposed to composites or images from a video surveillance tape).

On average, distributed searches were conducted in 7 to 14 seconds, with one search taking 4 seconds that proved to be a match.

Since the system is located in the booking area, arresting officers are able to use *VS-Ident*, when the Ident office is closed, to search the 3 databases at the time a suspect is booked.

Information and comments were provided for 265 searches. Please see Table 3.

Table 3 – Information on searches conducted by Chatham-Kent Police Service

				Input image	Performance characteristics
Total number of searches	**265**	**No match found**	**88**	- from composites, surveillance tape, photos	- There was no indication that matches for these existed in any of the three databases. - It was known that some of the suspects had been booked by other Ontario Police Services, including Toronto. Comments for these searches were that it would be beneficial to be networked with the databases of other police services.
		Match found	**177**	- old/new mug shots, photos and surveillance tape	- Four individuals were identified from unknown photos (i.e., the suspect was unknown); they were ranked #1. - Three of the eight matches were found in YRPS's database; one was found in Windsor's database.

Table 4 – Detailed information for matches found

IMAGE TYPE	Total number of searches	Match found	Match not found	Match found within first 10 search results displayed	Match found within search results with rank greater than 10
Old 35 mm photographs	10	2	8	1	1
Old/New mug shots	234	170	64	127	43
Video Surveillance Tape	15	1	14	1	0
Live Searches	2	2	0	2	0
Mug shots from other agencies	4	2	2	2	0
Total	**265**	**177**	**88**	**133**	**44**

Chart 4 – Chatham-Kent search results

33%

67%

- Match Found
- Match Not Found

25%

75%

- Match found within first 10 search results displayed

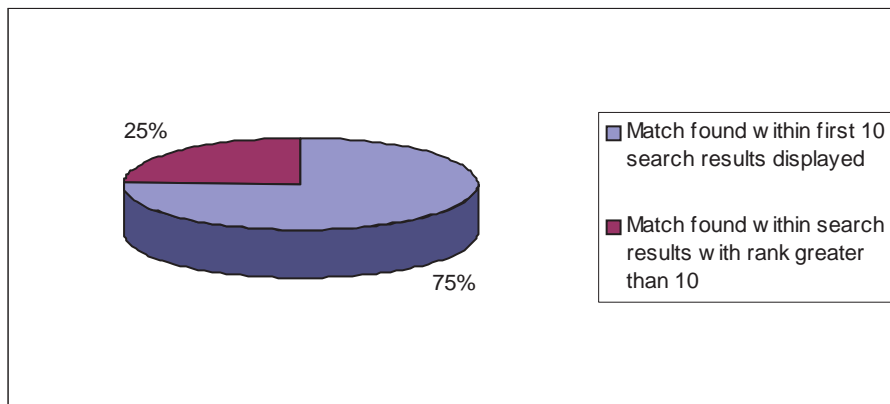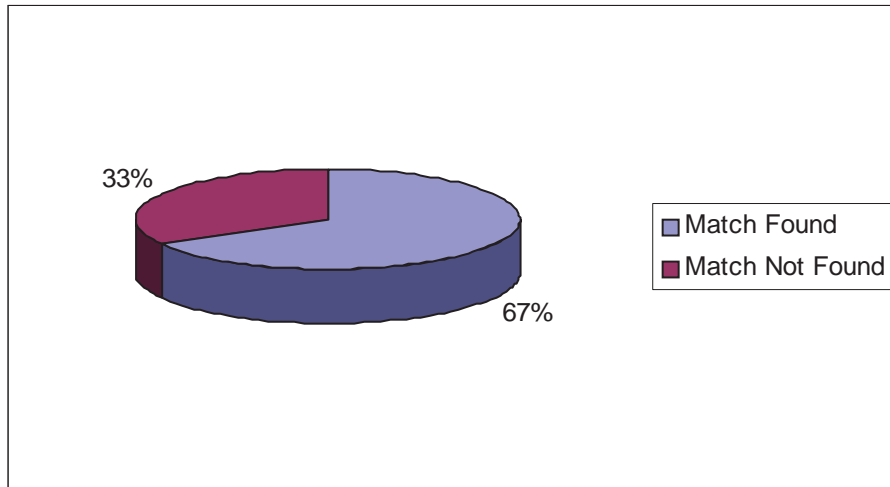- Match found within search results with rank greater than 10

Chart 5 – Chatham-Kent rank results

Comments from Rae Morrell, head of the Forensic Identification Unit, CKPS

Chatham-Kent Police Service (CKPS) appreciated being part of this research project, and was pleased help enhance and report on this leading edge technology for the betterment of the law enforcement community and public safety.

CKPS joined project "BlueBear" in May 2002 with the intention of researching how facial recognition technology could enhance the already successful electronic capture and transmission of mug shots.

- CKPS found the underlying *VS-Ident* technology, and the concept of Project BlueBear a success.
- *VS-Ident* provided constant verification of offenders being processed by Police Officers who did not know the individuals they were dealing with.
- Searching unknown facial images from surveillance video footage and intelligence still photos gave us the added opportunity to access possible matches that was not available before.

- This Facial Recognition system was found to be very user friendly and easily usable by all persons trained.
- Because *VS-Ident* was deployed as a stand-alone system, unconnected to the CKPS LAN, it was necessary to enter the offenders in the VisionSphere (VS-Ident) system a second time after they had been entered in the Niche electronic mug shot system.
- The system would be an added time saver, more effective and easier to use, if it were deployed on our police LAN, which is expected in next phase of the project.
- Verifying the offender's identity by a facial search was very rapid, and was found to be a time saver.
- The search time was outstanding, anywhere from 5 seconds to 15 seconds, for a search of the 3 combined databases, with approximately 118,000 images.
- Unfortunately, there were a significant number of searches that did not provide a match. We later discovered that there was either no mug shot of the suspect available in the three Police Service databases, or the suspect's mug shot was located in another Police Agency's mug shot database that *was not* a participant in Project BlueBear.
- This reaffirms the belief that this technology could be far more successful in identifying suspects and offenders if a greater number of Police Services participated in its deployment.
- Because we have had impressive successes in varying scenarios, CKPS remains committed to the continuation of project BlueBear and it's further development.

Comments from Inspector George Flikweert, Criminal Investigations, CKPS

As technologies evolve we as a police community must move with them to remain effective. Facial recognition is just one of the areas to where policing services must migrate. In an arena of ever-increasing budget constraints, policing must remain cost effective. With the speed and the simultaneous searches of participating police service databases, the issues of cost effectiveness in this field is addressed.

The sharing of databases with the other participating agencies is a step in the right direction in terms of expanding outside of traditional boundaries and sharing of information within the police community. For the pilot, three Services was a step in the proper direction. The effectiveness can only increase with the number of services involved.

Furthermore, it would be very beneficial to have facial recognition tied to Ontario's *Sex Offender Registry* for verification of registered offenders as well as to identity possible offenders from surveillance video images or witness composite images.

Chatham-Kent search highlights

- At the CKPS, late in the evening on November 27, 2003, a man was arrested and officers questioned his identity. The next morning, Rae Morrell, head of CKPS's forensic identification unit, photographed the individual and ran it through the 3 mug-shot databases. A match was found in York Regional's database; it took 11 seconds.
- A search was conducted in the three databases using a cropped facial image taken from a 35 mm photograph; a match was found in # 3 position.
- An image of a person, with face turned slightly down, was taken from a bank-robbery video; a search was conduced in the 3 databases; a match was found in # 14 position.
- A search of a mug shot, taken in 2000 and submitted by a neighbouring police service, was conducted in CKPS's database; a match (1995 mug shot) was located in # 5 position. In the 2000 mug shot, the person was bald; in the 1995 mug shot, the person had long hair.

- On three different occasions, members of a gang were apprehended; a search, conducted in the 3 databases, provided no matches. They were located, later, in 3 Police Service mug-shot databases not linked to the databases of Pilot Project Blue Bear participants.

- The system would have been more effective in identifying suspect's and offenders if there had been more than three police services on board.

- The most likely reason for not finding a match is that the mug shot is in an un-networked database.

- Search time is great: 5 to 15 seconds for results.

- Timeliness is very important. Sometimes, when trying to verify a suspect with the appropriate officer in another police service, if that person is not in the office (a day off; holidays), the request for information is delayed.

- Sharing information is key. *"Territorial"* attitudes have to be replaced with a "*sharing*" attitude: the more connected police services are, the more coverage they have.

Getting better results from the technology

The following are general observations based on VisionSphere's experience with Project BlueBear.

- The search results depend on the quality of the images in the database as well as of the images used as input images.

- The best results are achieved if the source and database images are of good quality and dead-on mug shots captured to National Institute of Standards & Technology (NIST) standards. Ontario is currently looking at the development of standards for mug shots.

- The more police services' databases are "*connected*," the greater the number of successes.

- The quality of composite image searches, amongst other variables, is dependent upon the quality of composite image generation software used.

- Constable Rae Morrell of Chatham-Kent Police Service an early adopter of the technology was a driving force in making the Project a success.

- Constable Sean Fitzgerald of York Regional Police not only did a through job searching old mug shots, video surveillance tapes, and composite images, but provided the framework for the development of *VS-Ident's* reporting facility. Sean enhanced the search reporting capability by breaking down search results into the following categories:
  o From a Live suspect or offender's image captured when being booked
  o From a facial image extracted from a video surveillance tape
  o From a stored digital facial image
  o From a scanned photograph, slide or negative
  o From a witness derived composite image

- VisionSphere will develop a tool that changes eye positions automatically.

- VisionSphere will provide software that converts a 2D facial image extracted from a surveillance video that will relocate the *facial pose* if necessary, into a frontal facial image, or mug shot.

- VisionSphere has enhanced its algorithm to rely on analyzing the whole face, eye positions as well as other features.

- VisionSphere has developed a facial template that removes shadows and eyeglasses from facial images.

- In the Commercial version of Project BlueBear VisionSphere will deploy a 3D facial image capture system.

- Police Services are most interested in using a livescan finger acquisition, and a digital record transmittal system based on the RCMP/NIST standard.

- Many Police Services indicated an interest in an AFIS distributed search system as well as a

distributed facial identification system that links participating Police Service databases.

- Many upgrades and improvements were made to *VS-Ident* and VisionSpehre's distributed search system during the duration of the project, which led to the system working efficiently, and consistently without down time.

WHAT'S HAPPENING NOW

VS-Ident at the Chatham courthouse

As a result of viewing the VS-Ident technology at Chatham-Kent Police Service, Sergeant Jim Biskey, head of court security at the Chatham courthouse, had the VS-Ident system installed at the courthouse, in November 2003 as a *secondary containment system*. If a visitor doesn't have photo identification or if the security officer feels that someone could be a potential security risk, a security officer can request that the visitor have his/her photo taken with the system's camera; within seconds the photo is run through the databases of Chatham-Kent, Windsor, and York Regional Police Services. This project will run for six months.

Live Scan, AFIS with Distributed Search

As an extension of Pilot Project BlueBear, VisionSphere will deploy an AFIS quality, high-resolution 10-print finger scanner, at Chatham-Kent Police Service this spring. The scanner, integrated with VS-Ident, will permit CKPS to send files containing raw fingerprint images, mug shots, and textual data to CPIC in the RCMP/NIST format. According to Rae Morrell (Chatham-Kent), "everyone may as well get on board now, because eventually all police services will have to submit digital fingerprints to the RCMP." The addition of an AFIS quality fingerprint matching software will allow Chatham-Kent to digitize and code their card-based fingerprints and search in seconds, other participating police services' distributed fingerprint databases.

Information Sharing Initiative

"The federal governments national criminal justice information sharing initiative intends to provide a broader access to essential crime and offender information by enhancing the technical capabilities of CPIC to include electronic messaging, photo/video transmission, as well as the electronic linking of new crime and offender repositories held across the country. Use of these national links would be broadened to include prosecutors, court officials, corrections and parole officials, and others as needed. New security features would address access and privacy issues, as well as protect the integrity of the information shared through this system." *(Integrated Justice Information Action Plan 1999-2004)*

CPIC Approval & Linkages to Provincial & Federal Integrated Justice Databases

At its March 2004 meeting the **CPIC Triumvirate** approved a request from Chatham-Kent Police Service to install VisionSphere's distributed search and information sharing system, linked to Chatham-Kent's local area network (LAN), which is connected to CPIC via GONet.

The initial approval from CPIC has led to a similar forthcoming request from another Police Service, requesting VisionSphere's system be deployed on its LAN, while using its existing IT infrastructure; a cost effective, search and information sharing solution.

The CPIC approval could lead to further requests from police services, courts and provincial jails, as is currently the case. York Regional Police Service including the York courthouse is planning to deploy the VisionSphere system on their LAN, later this spring, and the Chatham Jail is seeking approval for a similar deployment. Previously the security staff of Metro East Detention Centre in Scarborough expressed a keen interest in VisionSphere's system. Both the Chatham Jail and the Metro East Detention Centre have helped identify various uses for the technology at a jail. With their help VisionSphere has identified many different applications for *VS-Ident* linked to participating police services, courthouses, jails, as well as provincial, and federal criminal justice locations.

The CPIC approval granted to Chatham-Kent Police Service permitting VisionSphere's technology to be deployed on its secure LAN will allow VisionSphere's system at Chatham-Kent, if requested to do so, to connect to provincial/federal databases, as envisioned by the Integrated Justice Information Action Plan.

Since some provincial and federal criminal justice information databases are currently not linked to CPIC, VisionSphere's solution, if it were utilized for that purpose, would be a highly secure, cost effective solution, that provides secure identification and information sharing amongst police, provincial, and federal, criminal justice information databases.

A few provincial/federal criminal justice information databases, whose linkage to police information systems would benefit public safety are, Offender Tracking Information System (OTIS); Integrated Court Offences Network (ICON); Justice Information System (JUSTIN), and Real-Time Identification (RTID).

CONCLUSION

Pilot Project BlueBear started out as a mug shot identification and information-sharing project. The process involved in bringing the Project BlueBear to a successful conclusion meant conducting a considerable market research amongst the law enforcement community in Canada and to some extent in the US. The market research indicated that Police Services were interested in a complete solution, which would provide them with a cost effective, integrated, AFIS, livescan, mug shot, aging software, and textual data, information sharing product. Being more familiar with fingerprint identification, police Ident officers were interested in using an AFIS product that included palm print identification. They found the concept of livescan, or digitally transmitting live fingerprint images, mug shots and textual data to the RCMP to be most useful, and a timesaver.

Police Ident officers indicated that the three most useful facets of facial identification were matching a suspect's facial images extracted from a video surveillance system, with linked, multiple, Police mug shot databases. The creation of

The market research also indicated that the integrated identification product would be more useful to Police Services and Municipalities, if it could provide solutions for other public safety related issues, such as lost Alzheimer's and mentally ill patients, and missing children. These applications all involve the use of facial identification.

The Next Steps - Integrated Digital Law Enforcement (*IDLE*)

To respond to the requirement of the federal information sharing initiative and that eventually, all Canadian police services will be compelled to submit digital fingerprint images and mug shots, as well as, 32 specified fields of textual data, electronically, to the RCMP, VisionSphere will deploy a browser based software/hardware solution, called Integrated Digital Law Enforcement or *IDLE*, a suite of integrated products that builds on the success of *VS-Ident*.

Under the scenario of BlueBear Networks as a commercial service, deployed at multiple police services in a public, private partnership, each police service, using *IDLE*, will be able to transmit required data to the RCMP, and still have the ability to simultaneously search in seconds, its local face/fingerprint/text database and those of *all* other linked police services.

VisionSphere offers its dual biometric and textual data search and information sharing application, *IDLE*, to the Law Enforcement and Integrated Justice Community. *IDLE* is installed on a secure Police local area network, yet it permits multiple linked police services, to securely, and simultaneously search and share biometric (mug shots & fingerprints) and textual data, in seconds, using existing IT infrastructure, and the global Internet. *IDLE,* a browser-based application will include several other technologies useful for forensic identification.

Acknowledgements

FOR FURTHER INFORMATION

Pilot Project BlueBear

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Pilot Project BlueBear, VisionSphere, VS-Ident, IDLE, etc.

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About the Canadian Police Research Centre

The Canadian Police Research Centre is a partnership of the National Research Council Canada, the Royal Canadian Mounted Police, and the Canadian Association of Chiefs of Police. The Centre is concerned with ensuring that the best equipment and information is available to the Canadian police community. Its mission is "to provide leadership and focus for a national program of research, development, evaluation, and commercialization in the law enforcement and public safety sectors in Canada." For more information, visit http://www.cprc.org/

About VisionSphere Technologies, Inc.

VisionSphere Technologies Inc. (VST) is a Biometric Application Solutions Provider that has developed embedded, fully integrated, multi-layered, face-recognition hardware/software solutions for Identity management & single sign-on authentication, secure physical access applications, and IP Digital Biometric Video Surveillance Systems. VisionSphere also provides secure, distributed biometric identification, and information sharing systems for the Law Enforcement and Integrated Justice Community. For more information, visit http://www.visionspheretech.com/.

O.P.T.I.C.

ONTARIO POLICE TECHNOLOGY & INFORMATION CO OPERATIVE

Ministry of Public Safety and Security
18 King Street East, 18th Floor, Toronto, Ontario M5C 2X1

18 October 2002

Mr. Sal Khan
CEO
Vision Sphere Technologies
Suite 231, Bldg. M50-IPF,
1200 Montreal Rd.,
Ottawa Ont. K1A 0R6

Dear Mr. S Khan

   I wish to express my personal appreciation for the demonstration of the facial recognition software application known as Vision Sphere. I must acknowledge the application would be beneficial to all Police Services, as resource for the purpose of "sharing of information", and thereby enhancing the opportunity to solve crimes that may be otherwise unsolved.

   The benefits can be seen for Police Services that are geographically in the same area, as criminals tend to move into adjacent areas of their home to avoid detection. On many occasions Police have only composites, or video evidence, but no names or other evidence.   Vision Sphere would be able to consolidate all facial recognition in the spirit of information sharing, thus increasing the ability to solve crimes.

   The areas of concern, Police have to consider are who becomes the "gate-keeper" of this data. Is it a single source, multiple sources with secure access, at a Municipal, Provincial or Federal level? Once this is established, I known Police would need to conduct some type of cost benefit analysis.

   I look forward to your continued work with Project Blue Bear, in the municipalities depicted. On behalf of the OPTIC Co-Operative, I would be interested in hearing of Police related incidents where VisonSpehere was a key resource tool in information sharing that ultimately leads to a successful conclusion.

Sincerely

Don Roskamp
Executive Director

Software extends far sight of the law.

Police test system that compares faces across multiple databases.

Vito Pilieci
The Ottawa Citizen
Thursday, June 06, 2002

The Ottawa Citizen
VisionSphere Technologies chief executive Sal Kahn says his company hopes to market it's facial-recognition system on a monthly subscription basis. But he was not prepared to disclose yesterday how much that might cost a police department.

An Ottawa company demonstrated new face-recognition software yesterday designed to help police sort through millions of mug shots.

VisionSphere Technologies' VSIdent is said to allow police in one city to match a mugshot with a photo in the database of another force -- even if the suspect has changed his looks or aged by a decade.

Yesterday, VisionSphere said it will test the system in police departments across the country with the Canadian Police Research Centre.

The Project BlueBear test involves setting it up in 10 municipal departments. It's already running in Ottawa, Montreal, Chatham-Kent, in southwestern Ontario, and Toronto.

"The whole point in what we are doing is trying to be able to share information better," said John Arnold, chief scientist for the CPRC.

"If we can provide tools to the police community to do it better, why wouldn't we do it?"

The system can compare a mugshot, video surveillance image or computerized drawing with millions of other pictures on a secure network and prepare a photographic lineup of possible matches.

The software assesses three-dimensional facial geometry and picks out pictures of similar faces.

Mr. Arnold said the Project BlueBear is expected to last until the end of this year.

"Police like to try it before they buy it," VisionSphere chief executive Sal Khan said. "If they find it useful, which I believe they will, they are going to want to keep it."

Other parties have shown interest in the technology.

Transport Canada tested numerous biometric technologies in April and May to see where they could help increase security at airports.

VisionSphere was tested at the Ottawa International Airport to verify the identity of airport workers in restricted areas.

Transport Canada will release the results of these tests and others using other kinds of technology, in the near future.

The RCMP have also expressed interest, said Lee Fraser, superintendent with the office in charge of forensic identification services.

Mr. Fraser said the RCMP is getting ready to re-engineer its criminal records system to re-catalogue and sort the volumes of mug shots and fingerprints the force has collected.

He said the RCMP is looking to evaluate several types of biometric technology.

The VSIdent system is one they are considering.

Mr. Khan said this test phase with the CPRC will allow VisionSphere to tailor it better to police activities.

The company hopes to roll out the system as a monthly subscription service. However, Mr. Khan would not say what it may cost.

Biometrics technology will never be as good as a trained investigator, said Mr. Arnold.

 "But it will narrow the search and save valuable time that could mean the difference between life and death."

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Canadian First: Police Share Photo Databases to Speed Criminal Identification
Sun Microsystems and VisionSphere Technologies team up to offer identification solution;
CATA Business Network Delivers Benefits

CATA*Alliance* President John Reid (centre) congratulates Sal Khan (left), VisionSphere's CEO and Norman LeCouvie, Director of Government Business Development for Sun Microsystems of Canada on their strategic partnership.

"CATA is dedicated to stimulating global growth for technology enterprises through the promotion of strategic partnerships, technological innovation and entrepreneurial values," said
Mr. Reid *, adding, "The Visionsphere and Sun Microsystems of Canada partnership is exemplary in this regard."*

Action Item:
> Organizations may be interested in the resources offered through CATA Biometrics Group , as a community of interest to promote security solutions. As well, CATA is conducting our first-ever study of Canada's security sector to give organizations like VisionSphere and Sun a roadmap to additional growth opportunities"

Action Request:
> Companies interested in partnership opportunities with Sun Microsystems of Canada should contact CATA by email at info@cata.ca with Sun Microsystems in the header. Please describe your partnership interests, and note the size (e.g., employees, annual revenues) of your company.

OTTAWA, June 17, 2003 -- Canadian police services will now be able to quickly search each other's mug-shot databases to track down criminal suspects. VisionSphere's VS-Ident solution-secure distributed networked search technology, integrated with the company's face-recognition search engine-and Sun servers make this possible.

VisionSphere and Sun Microsystems announced recently that they've teamed up in "Pilot Project BlueBear," which was launched with the Chatham-Kent, Windsor, and York Region police services, located in southern Ontario. The project allows the participants to quickly and simultaneously search each other's mug-shot and text databases, in a highly secure environment over the Internet. "Police services are not always able to acquire nor share critical information with each other quickly," says **Sal Khan**, VisionSphere's Chief Executive Officer. "VS-Ident can give the Canadian law enforcement community a real edge in tracking down criminal suspects, because it facilitates secure, fast, easy collaboration and information-sharing."

"This technology has enormous potential to speed up the sharing of information in the police community," says **John Arnold**, Chief Scientist with the Canadian Police Research Centre (CPRC), the sponsor of the pilot project. "Imagine being able to search thousands of mug shots in real time securely over the Internet. Nothing like this has been attempted before. It's a

real accomplishment for Canada."

Sun LX 50 servers, running the Linux Operating System, perform as secure gateways to the mug-shot and text databases of the participants and give them access to VisionSphere's VS-Ident technology. In several preliminary tests, a Sun LX 50 server accurately searched 100,000 facial templates in four seconds over the Internet.

Currently, those Canadian police services that have mug-shot databases can only check the identity of a suspect against their own database. With VS-Ident, they could have access to what VisionSphere estimates to be four to five million mug shots located in police databases across Canada. As well, police services that don't have their own mug-shot databases could have access to existing ones with VS-Ident.

"We are pleased to see Canada's technology leaders work within the CATA business network," said CATA President, John Reid. "CATA exists to spur business growth, and CATA Biometrics Group is a natural community for these companies to join. In addition, our first ever study of Canada's advanced security sectors will give organizations like Visionsphere and Sun Microsystems a roadmap to additional growth opportunities."

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About the CPRC
The Canadian Police Research Centre is a partnership of the National Research Council Canada, the Royal Canadian Mounted Police, and the Canadian Association of Chiefs of Police. The Centre is concerned with ensuring that the best equipment and information is available to the Canadian police community. Its mission is "to provide leadership and focus for a national program of research, development, evaluation, and commercialization in the law enforcement and public safety sectors in Canada." For more information, visit http://www.cprc.org/

About VisionSphere Technologies Inc.
VisionSphere Technologies Inc. is an Ottawa-based identification solutions provider with face recognition as the primary biometric identifier. It has developed the world's first totally integrated face-recognition hardware/software solution. VisionSphere's innovative products provide improved security within the sphere of secure networked identification, authenticated computer network access, and authentication for secure access applications. For more information, visit http://www.visionspheretech.com/

About Sun Microsystems of Canada Inc.
Sun Microsystems of Canada Inc., a subsidiary of Sun Microsystems, Inc., is headquartered

in Markham, Ontario. The company, which employs more than 550 persons, has offices in Montreal, Ottawa, Calgary, Vancouver and Victoria. Sun products and services are also available through Sun Authorized Independent Sales Organizations and iForce[SM] partners across Canada. For more information, visit http://ca.sun.com.

About Sun Microsystems, Inc.
Since its inception in 1982, a singular vision -- "The Network Is The Computer[TM]" -- has propelled Sun Microsystems, Inc. (Nasdaq: SUNW) to its position as a leading provider of industrial-strength hardware, software and services that make the Net work. Sun can be found in more than 100 countries and on the World Wide Web at http://sun.com.

About CATA*Alliance*:
CATA*Alliance* is a business development association dedicated to stimulating global growth for technology enterprises through the promotion of strategic partnerships, technological innovation and entrepreneurial values. More information about CATA can be found on the CATA Web site: www.cata.ca
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Police forces team up to access mug shots online

6/17/2003 5:00:00 PM - A pilot project could change the way law enforcement officials across the country share information during investigations. We look at how distributed search technology could speed the search for Holly Jones' killer

by Kristy Pryma

A pilot project launched in three southern Ontario police forces is using distributed networked search technology and a facial recognition search engine to bring down the bad guys.

The project, currently being tested within the Chatham-Kent, Windsor and York Region police services, allows participants to share and search each other's mug shot and text databases simultaneously and securely over the Internet. This is done using VisionSphere's VS-Ident solution, which its CEO, Ottawa-based Sal Khan said has the potential to connect every police department in Canada.

"There are approximately 500 police departments in Canada and if they were all linked together we would have a total of four to five million mug shots that could be searched simultaneously," Khan said.

If adopted on a large scale after the pilot project is completed, larger police departments with arresting and booking systems can expect to benefit from the shared information, while smaller departments could potentially have access to a mug-shot database for the first time via the Internet, Khan said.

Dave Juck, York Region's point person on the pilot project, said that he is optimistic about the use of the technology.

"If someone has been assaulted and works with a composite artist to come up with a composite sketch, it can be put into the machine and we'd expect to see some kind of results," he said.

The technology compares faces using a template, which Juck said distinguishes hard features such as eye color or nose width rather than race or sex.

"It takes the topography of the face and finds possibilities to look through," Juck said.

VS-Ident can also search databases using other image sources including surveillance videos and security photos. According to Khan the system takes mere seconds to sort through the images, which is an important factor.

"Think of what's in the news right now," he said, referring to Toronto's current investigation of the murderer of 10 year old Holly Jones. "If the police had the description of a suspect, they could run it through thousands of images in seconds."

The pilot project is using <u>Sun Microsystems</u>' Sun LX 50 servers running Linux, and in several preliminary tests it was reported that one of the servers searched 100,000 facial templates in four seconds over the Internet.

According to Khan, the tool could be used in other environments where photo databases are kept such as border crossings . While it has the potential to administer databases of other catalogued information like fingerprints, Khan said there are no plans to include such information at this time. However, the search engine is able to search text databases that house information such as tattoos and distinguishing scars.

Juck sees the technology as having great potential for the future of law enforcement, but stressed that it is just another tool.

"If it's going to be effective, we'll add it to our arsenal of tools," Juck said. "Anything to help bring a criminal to justice —— that's the name of the game."

Smile, you're on court camera!

Diana Martin Photo

FIRST OF ITS KIND: Sgt. Jim Biskey displays a computer program and a biometric camera that will allow court officers to take photos and search them against mugshot databases.

Facial recognition technology a first for North America

By Erica Brown, The Daily News

Tuesday, November 18, 2003

Your eyes are more than just windows to your soul at the Chatham courthouse.

The local hall of justice is the first in North America to have facial recognition technology at the front door.

Security officers can take your picture when you enter the courthouse and within seconds run your face through mugshot databases from Chatham-Kent, Windsor and York Region.

Using your eyes as a point of reference, a biometric template of your face is created and matched against mugshots, said Sal Khan, CEO of VisionSphere Technologies.

The company developed the software which allows police services to share their databases securely.

The technology used at the courthouse is a pilot project with Project BlueBear – an initiative which allows the three police services to search for suspects through each other's mugshots.

There are nearly 120,000 photos in the system, Khan said.

"It's just one other tool for us to identify and protect people here", said Sgt. Jim Biskey, head of court security.

He said the pilot will run for a year.

Const. Rae Morrell, of the CKPS forensic identification unit, said since Project BlueBear started in May 2002, it's come in handy.

He explained that the technology allows police to find out who people are, similar to how a fingerprint is used as an identification tool.

And like a fingerprint, Morrell said, it is still up to the human eye to make a definitive match. He said the software will show a number of mugshots that are similar to a face and then officers must determine if any are a match.

Biskey said not everyone will have their photo taken with the biometric camera. He said that decision will be made by security officers. People who can't produce a photo ID and others who officers feel are a potential security risk will be scanned.

He said the metal detector, situated at the front door, is proof that security is needed at the courthouse.

Officers have seized more than 200 knives and made 10 arrests at the courthouse entrance since it opened in August, Biskey said. One person was arrested for carrying a switchblade.

He added the others were arrested for breach of probation or bail and arrest warrants.

Wednesday, December 3, 2003

Mugshot match made

By Erica Brown, The Daily News

The Chatham-Kent Police Service is proof mugshot sharing technology is useful.

The local service reported the first-ever live mugshot match last week, said Sal Khan, CEO of VisionSphere Technologies Inc.

CKPS, York Regional Police and the Windsor Police Service are participants in pilot Project BlueBear – an initiative which allows the three agencies to search for suspects through each other's mugshots.

Khan said the CKPS is the first to run a suspect at the police station through the database and get a match.

"It certainly helps confirm the value of it", said CKPS Const. Rae Morrell, of the forensic identification unit.

He said a man was arrested late Thursday night and officers questioned his identity.

Morrell took a picture of the man Friday morning and run it through the three police service's mugshot databases. It took 11 seconds for Morrell to find a match. Nearly 120,000 mugshots were searched in that time, he said.

The man's mugshot was taken by York Regional police in 1988.

Fingers do the talking

Diana Martin Photo

Chatham-Kent police SERVICE Const. Rae Morrell ...shows how the Cross Match ID 500 machine takes electronic fingerprints

C-K fingerprint technology a Canadian first

By Adam D. Booth, Special to The Daily News

Wednesday, December 10, 2003 - 09:00

Local News - On the heels of adopting a hi-tech means of gathering mugshots, Chatham-Kent police will become the first service in Canada to have a computerized way to collect fingerprints.

New scanning technology allows police to build a physical profile of an individual using digital data of that person's fingerprints as well as other distinguishing features, such as eye or hair colour.

The data can then be sent securely across the Internet to the RCMP database, which other police forces can search.

Prior to this technology, labelled the Cross Match ID system, this kind of data would need to be sent through traditional mail.

Sal Khan, CEO of VisionSphere Technologies, said the option of taking fingerprints electronically instead of using ink may be new to Canada, but it is something that has already been in use by police bodies in the U.S. VisionSphere played a part in the development of the technology.

"You name a (police) body in the U.S., and they're using it." Khan said.

VisionSphere Technologies developed the facial recognition technology used to acquire and share mugshot information that the Chatham courthouse and the Chatham-Kent Police Service adopted recently.

Const. Rae Morrell, of the CKPS forensic identification unit, said they probably would have embraced the Cross Match system even if the facial recognition technology had not proved as effective as it has.

 "I've always been one to look one step ahead, to see where we can go next." Morrell said.

The mugshot database made its first match Nov. 28, revealing the identity of a man arrested the night before.

"I think the mugshot system has proven its potential value," Morrell said.

The actual device which scans the prints requires an individual to place their fingers on the scanner with a very light touch. Pressing down too hard on the scanner can distort the image.

However, the program can identify if the image of a person's print is unclear and asks them to re-scan it until it has acquired clear images from all of a person's fingertips, Khan said.

The system will soon be introduced to the Windsor and York Region police forces, to see if either is also interested in upgrading to it.

York Region and Windsor are fellow members of the BlueBear Project with the CKPS.

The project involves the Windsor, York, and Chatham-Kent police forces pooling their resources by sharing their mugshot databases.

GLOBEANDMAIL.COM

Police forces build mug-shot database

By JIM BRONSKILL
Canadian Press

Saturday, Sep 11, 2004

OTTAWA -- Canadian police forces have begun electronically sharing mug shots as part of a project that could eventually lead to a nationwide database of crime suspect photos.

Three Ontario police services converted their mug-shot files into digital images for the pilot project, then pooled their efforts to create a searchable on-line library of 118,000 photos.

Police used the computerized tool to quickly -- and often successfully -- compare images of people they arrested with the virtual library, which contains photos from old mug-shot books, video surveillance tapes and composite drawings.

"Matches could be found even where the subject went from long hair to bald in five years," says a recent report by the Canadian Police Research Centre, one of the participants.

The project is just one example of how law-enforcement, security and intelligence agencies are embracing biometric technologies that statistically study biological phenomena in the aftermath of the Sept. 11, 2001, attacks on the United States.

Authorities say the terrorist assaults revealed a glaring need to better track and share information about people of concern.

Critics predict the move toward reliance on such biometric identifiers as fingerprints, facial images and iris scans will be a troubling legacy of 9/11. They foresee an Orwellian society in which civil liberties and privacy are sacrificed in the name of national security.

Advocates insist the brave new technologies will make Canada a safer place.

The digital mug-shot initiative, known as Project BlueBear, was a collaboration of the Canadian Police Research Centre, private firm VisionSphere Technologies Inc. and the southern Ontario police services of York, Windsor and Chatham-Kent.

Announcing the pilot effort two years ago, John Arnold, chief scientist for the police research centre, said "the events of 9/11 clearly demonstrate the need for police services on both sides of the border to share information in a more timely, cost-effective way."

Participants feel the best police uses for the facial-recognition technology are confirming the identity of suspects before they are booked, identifying faces caught on video surveillance systems and compiling databases of suspects.

All agreed that the BlueBear system would be even more effective linked to larger and more police mug-shot systems.

The initiative could help fulfill a federal goal of ensuring all Canadian police services can collect and transmit digital fingerprint images, mug shots and biographical data.

While the events of Sept. 11 seem to have accelerated adoption of high-tech tools and security watch lists, experts question their value in fighting terrorism.

"In the case of 9/11, only two of the 19 attackers would have appeared on watch lists and would have been stopped," said Andrew Clement, an information studies professor at the University of Toronto.

Dogged investigation and field work is necessary to determine whether someone might be a terrorist, particularly since many try to keep an ultra-low profile before committing a deadly act, he said.

"If they are a suicide bomber, they only get to do it once. There's no record; there's no database of their prior activity that indicates danger."

A federal task force on identity documents acknowledged earlier this year that biometrics cannot conclusively establish a person's identity.

"Nor can biometrics replace the intelligence necessary to determine that someone is likely to be a terrorist, or some other public-security concern," the task force reported.

However, the paper added, such digital markers can help support investigative work and "may prove to be the only speedy or non-discriminatory way to identify impostors or people of security concern."

Among the initiatives involving biometrics currently in the works:

Proposals that would require virtually all newcomers to Canada, including visitors, refugees, permanent residents and new citizens, to be fingerprinted and photographed;

An electronic passport featuring the holder's photo and biographical information on a computer chip;

Electronic comparison of photos of passport applicants against images of people on security watch lists.

Some see these watch lists as the Achilles heel of the biometric strategy.

The often poor quality of such files means matches can actually be serious cases of mistaken identity, says Roch Tassé of the Ottawa-based International Civil Liberties Monitoring Group.

"There's no coherent system to manage those lists."

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SHARING INFORMATION AND A SECURE BORDER:

AN UPDATE ON INTEGRATED JUSTICE **INFORMATION PROJECTS ACROSS CANADA** AND A LOOK AT **CANADA-U.S. INFORMATION SHARING ACTIVITIES**
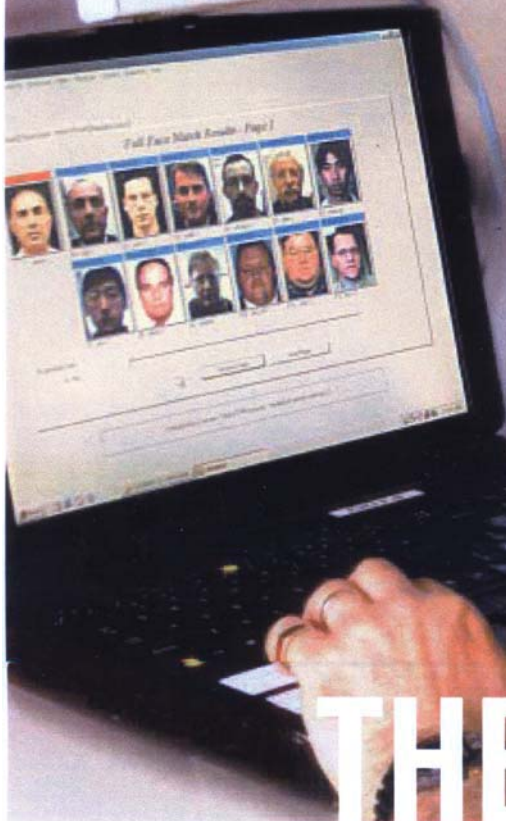
PARTNERS IN PROFILE

MANITOBA'S INTEGRATED LEGISLATIVE RESPONSE TEAM

THE **SASKATCHEWAN** YOUNG OFFENDER CASE ADMINISTRATION MANAGEMENT SYSTEM

Canada

JOHN ARNOLD, CHIEF SCIENTIST,
CANADIAN POLICE RESEARCH CENTRE

THE FACE OF THE FUTURE

Project BlueBear makes
the case for facial-recognition technology

IN RECENT YEARS, TECHNOLOGICAL ADVANCEMENTS HAVE MADE IT POSSIBLE FOR CRIMINAL-JUSTICE ORGANIZATIONS TO ADOPT SOME TRULY SOPHISTICATED BIOMETRIC IDENTIFICATION SYSTEMS— EVERYTHING FROM ELECTRONIC FINGERPRINT READERS TO RETINAL SCANNERS.

YET JOHN ARNOLD, CHIEF SCIENTIST OF THE CANADIAN POLICE RESEARCH CENTRE (CPRC) AT THE NATIONAL RESEARCH COUNCIL (NRC), SUGGESTS THAT FOR POLICE IDENTIFICATION WORK, THE BEST BIOMETRIC MAY BE RIGHT UNDER OUR NOSES. OR MORE PRECISELY, ALL AROUND OUR NOSES: THE HUMAN FACE.

THE ROAD TO RECOGNITION

"I've been involved in police research for 30 years," Arnold explains. "For a long time, I've wanted to explore this idea of using the face as a biometric. One of the chief advantages is that anyone can recognize a face: it doesn't take specialized training. As information, pictures of faces are easy to share. And the technologies involved are actually very cost effective."

An opportunity arose for Arnold to investigate the potential of face-recognition technology in 2001 when he struck up a conversation with Sal Kahn.

Kahn is the CEO of VisionSphere Technologies (VST)—a private-sector tenant of the Information and Telecommunications Technologies' Industry Partnership Facility at the National Research Council's Montreal Road campus in Ottawa. VST specializes in the development of biometric face-recognition hardware and software.

The initial conversation between Arnold and Kahn led to a technology showcase at the NRC in February 2002. Invitations went out to the police community, and everyone who came was treated to a demonstration of VisionSphere's face-recognition technology.

At the same time, CPRC and VisionSphere pitched the idea of involving interested police departments in a pilot project— dubbed 'BlueBear'—to test the technology in a real-world setting.

BLUEBEAR IN THE FIELD

One of the first organizations on board for the project was the Chatham-Kent police service, based in southwestern Ontario. Word of mouth spread quickly, and soon the Windsor police force also signed up.

In June 2002, the BlueBear project team hosted a meeting at NRC to demonstrate how the mug-shot systems of different police departments could be linked together to facilitate information sharing. For the pilot project, a third participant was needed; in the Fall of 2002, York Regional Police volunteered.

"The proponents of the system were the ID officers," John Arnold explains. "Not IT, not criminal investigators—but the people in Ident who do the bookings. If you look at the pattern of how technology is adopted by police, this is it: at the grassroots level, by word of mouth, in little bits at a time."

While designing the BlueBear pilot project, Arnold and his collaborators were keenly aware of this pattern. In the late 1990s, CPRC proposed a methodology for introducing information technology into the police community. It was called PS3 and, essentially, its approach was to initiate technology adoption via small pilot projects on the front lines.

The elements of PS3 were as follows:
1. To carry out pilot projects within the police community over a research network rather than a police operational network.
2. To deliver working products operationally, once pilot testing was finished, via a pay-per-use application service provider (ASP) model to keep costs down.
3. To provide e-learning on the police research network.

"The proponents of the system were the ID officers," John Arnold explains. "Not IT, not criminal investigators—but the people in Ident who do the bookings.

PARTNERS
IN TECHNOLOGY

The BlueBear project was modeled on the PS3 approach. Ontario was chosen as the testing ground due to VST's presence there. There is also a high concentration of police. Of the 57,000 police officers in Canada, one-third are in Ontario, excluding the RCMP.

Now that Chatham-Kent, Windsor and York Region have their own stand-alone face-recognition systems, the next step for project BlueBear will be to connect them, enabling each department to search the others' electronic mugbooks securely and remotely. This is expected to occur by Summer 2003.

"The advantages of this technology are phenomenal," concludes Arnold, "because it allows police services to easily share important identification information electronically at a relatively low cost. And the way we've set up this pilot project allows smaller police departments to be part of the process, testing the technology for themselves."

Looking to the future, Arnold considers the potential demand for a proven face-recognition solution on the border—and south of it. "The market is huge for something like this in the U.S. So in addition to all of the public safety benefits we'd experience here in Canada if it were to be widely adopted, there's also the real possibility of some economic gain."

Project BlueBear

THE TECHNOLOGY AND HOW IT WORKS

Project BlueBear is based on VisionSphere Technologies' face-recognition solution. That solution embeds a secure, distributed search technology within a face-recognition engine, enabling police departments to search their own—and their partners'—mugshot databases simultaneously over a network. Results are available within minutes, helping police identify suspects.

John Arnold describes a typical scenario in which a system like this would be valuable: "Say you're a police detachment in a small community. You pick up a suspect and bring him in for booking. You don't have him in your files. So you take his picture, and VST's facial recognition system, VSIdent, translates it into a number—or biometric—then feeds that metric into your system for an online search. Because you're connected to other departments' mugshot databases, you have access to a broader range of records. Maybe your partners have seen this suspect before. If his picture is in one of their systems, you'll be able to ID him."

Security is obviously critical for an application like this. VisionSphere's technology allows linked computers to interoperate in a highly flexible manner; the information they share is shared securely, and access to each department's internal systems is restricted.

What makes this solution so flexible is that it does not require the use of a centralized database. Every participating organization maintains its own internal database and its own IT infrastructure. For the BlueBear pilot, information is shared from a variety of departmental mugshot systems; those files are then searched and shared easily and seamlessly.

"Because this system doesn't demand any major IT overhaul or expensive capital investment," says Arnold, "it's a truly cost-effective information-sharing tool for police services. This is something that even a small municipal department can use and afford."
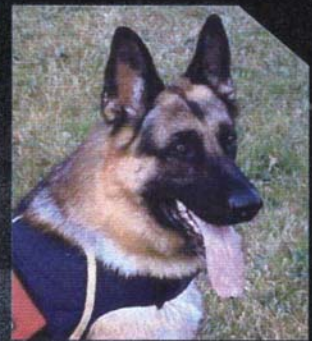
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- March 2004: The CPRC hosted a founders' meeting, which included participation of the Justice Knowledge Network. The CPRC was asked to lead, manage, and develop the Canadian Police Knowledge Network (CPKN) at the NRC. The following principles for the CPKN were agreed to at this meeting:

  - Establish a small advisory board to guide the CPKN.

  - Foster a collaborative attitude among Canadian police leaders in e-learning and e-working.

  - Focus on production of high quality e-learning solutions.

  - Leverage federal government investments in e-learning building on those successes.

  - Endorse a model of economic sustainability.

- April 2004: The CPRC set up the advisory board to CPKN.

- May 2004: The CPKN was announced to the broader Canadian police educational community at the annual CAPE conference. A national needs assessment survey was launched at CAPE.

"Aged" photos can be added to Project BlueBear's facial recognition database.

Project BlueBear — Concluded

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Over the past two years, the CPRC has been working with the Ottawa company VisionSphere Technologies (VST) on a facial recognition technology pilot project, to see if it is a worthwhile investigative tool in the police environment. This project, called "BlueBear", has now successfully concluded.

VST was selected for this pilot project because it has developed an advanced, fully integrated facial recognition technology (FRT) system. Their inexpensive camera is software controlled, dramatically improving the accuracy, reliability, and scalability of the technology in operational conditions.

The facial recognition technology converts existing "mugshot" pictures to a facial recognition bio-metric. This digital "template" or "number" is then stored in a computerized facial recognition database. The computer's rapid search capabilities produces a match—with varying degrees of accuracy—from this facial recognition database.

The production of the facial recognition bio-metric allows police investigators to carry out FRT searches using a captured suspect mugshot, as well as police artist composite sketches. The pilot project also evaluated images extracted from video surveillance tapes, news video, passports, photographs, and negatives to determine the FRT's degree of accuracy.

The Chatham–Kent, Windsor, and York police services volunteered to become members of the pilot project.

Lessons learned in this project include:

- The best uses for facial identification technology within a police forensic identification environment were to confirm the identity of a suspect prior to booking, to identify facial images extracted from video surveillance systems, and to create a facial image suspect database.

- The distributed secure searches of mugshot and text databases can be done via the Internet, making this approach cost tolerant and efficient.

- The BlueBear system would be even more effective if it was linked to more police mugshot systems.

- It would be more convenient, and significantly easier, to keep databases up to date by having the VS-Ident server connected to individual arrest and booking systems. This has been resolved at the Chatham–Kent Police Service.

- Providing digital fingerprint services with facial identification technology would make the solution more complete.

- As an extension of Pilot Project BlueBear, VisionSphere will be conducting a trial of an AFIS quality, high-resolution, 10-print finger scanner at Chatham–Kent Police Service. This will happen in the second quarter of 2004.

SCCan: Security Communities Canada — Active

Security Communities meeting on Marine Security, St. John's, Newfoundland, October, 2003.

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The events of September 11, 2001 indicated that, more than ever before, the business of security and public safety is critical to the well being of Canadians. New ways of doing business to quickly respond to these pressures must be in place to guarantee the safety and security of our communities. In order to address fast emerging safety and security issues from both government and business perspectives, it is necessary to quickly, effectively, and efficiently communicate and network to address situations such as the terrorist attacks of 2001.

To have an impact on terrorism, we need to know what innovative technologies are available in Canada. First we need to examine what technologies can be applied immediately to the terrorism problem. Then we need to identify potential technologies that could be used. It is possible that Canadian capabilities are not well known. This is where security communities become important, by sharing the information that they have.

A security community is a regional collection of security technology. Its main purpose is to provide a forum for networking and collaboration—a voice and focus for the public safety and security community, from the user perspective and the provider (industry) perspective. The community provides a level of comfort to meet, discuss, share, and educate the users and providers in the field of security and public safety technology issues.

The proactive approach of the Security Communities Canada (SCCan) was developed by the CPRC and the National Research Council (NRC), in partnership with NRC's Canadian Technology Network (CTN). SCCan supports and maintains the necessary dialogue to get security issues dealt with today, rather than tomorrow. NRC's Industrial Research Assistance Program (IRAP) has a crucial role to play in the technology identification process. There is no other organization in Canada that has the connectivity and knowledge of what is going on in the Canadian technology community of the small- to medium-sized enterprises (SMEs). In a typical year, IRAP deals with about 12,000 SMEs, and only some of these have technology that is appropriate to user needs. The SCCan initiative addresses this void.

The objectives of SCCan are to:

- provide an identity for the Canadian technology companies in matters concerning public safety and security issues

- share and discuss technology issues of importance to the safety and security of Canadians

- provide a venue that allows for dialogue and awareness of local capabilities between the developers and the users of these technologies

- create an environment for discussion of problems and solutions