



NRC-CNRC

*Institute for
Information
Technology*

The National Research Council in New Brunswick

7 October 2008

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Senior Researcher



National Research
Council Canada

Conseil national
de recherches Canada

Canada

Our Vision:

To be valued as the world's best national organization for research and innovation

Strategic Outcome:

To provide integrated science and technology solutions in areas of critical importance to Canada

Goal 1:

To contribute to the global competitiveness of Canadian industry in key sectors and to the economic viability of communities

Industry Sectors

Community
Innovation

Goal 2:

To make significant contributions to Canada's priorities – areas critical to Canada's future

Environment

Health &
Wellness

Sustainable
Energy

Goal 3:

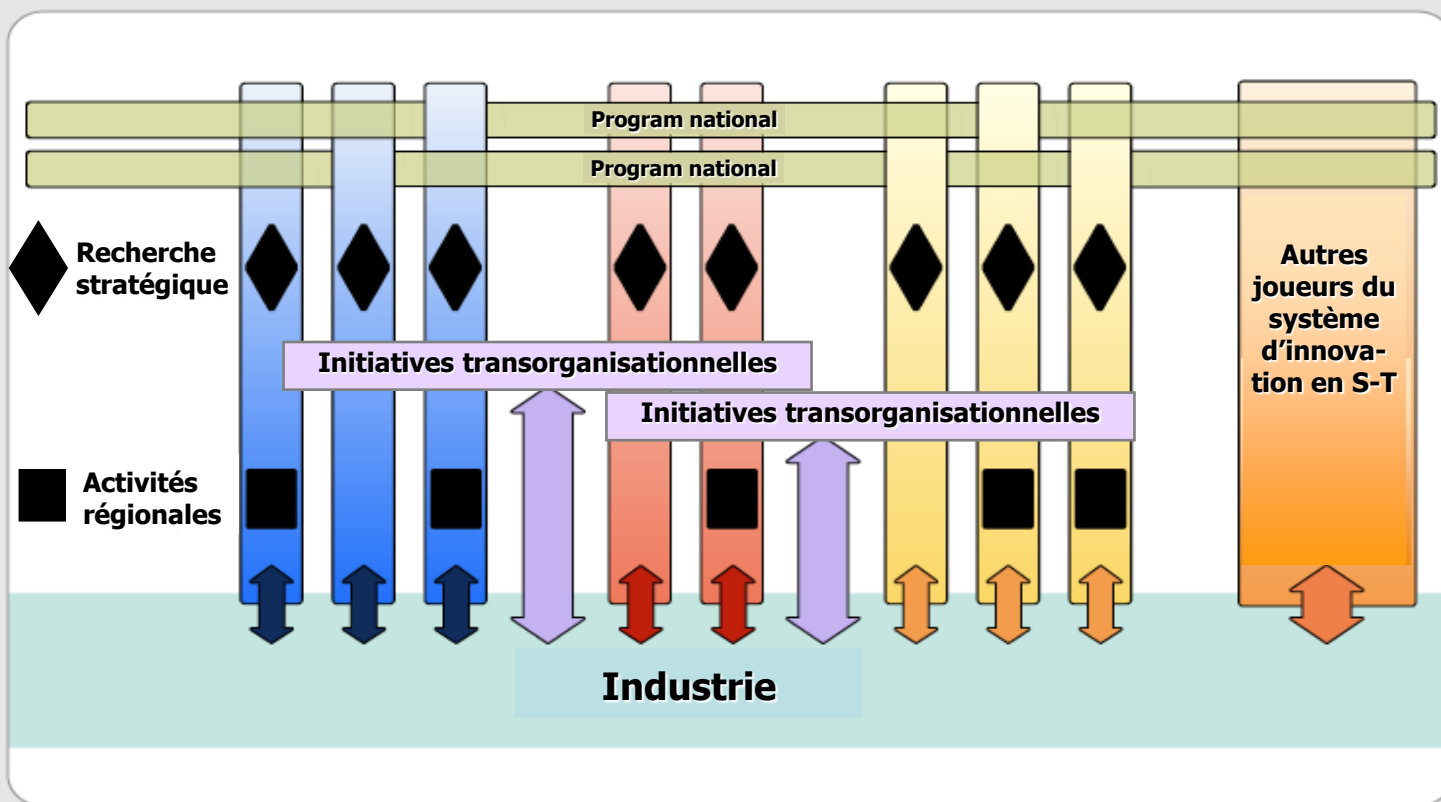
To strengthen Canada's innovation system

Mandated
Activities

National
Facilities

Structure des programmes du CNRC

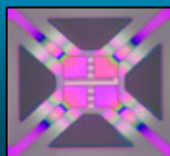
Structure des programmes du CNRC



Instituts et programmes regroupés
dans des portefeuilles

Neuf secteurs clés

Instrument
électronique



Aérospatiale



Agriculture



Information et
communication



Critères de sélection

- Importance pour l'économie canadienne
- Dépendant de la recherche
- Secteurs dans lesquels le CNRC peut apporter une contribution importante

Automobile



Construction



Produits
chimiques



Bio-
pharmaceutique



Fabrication et
matériaux

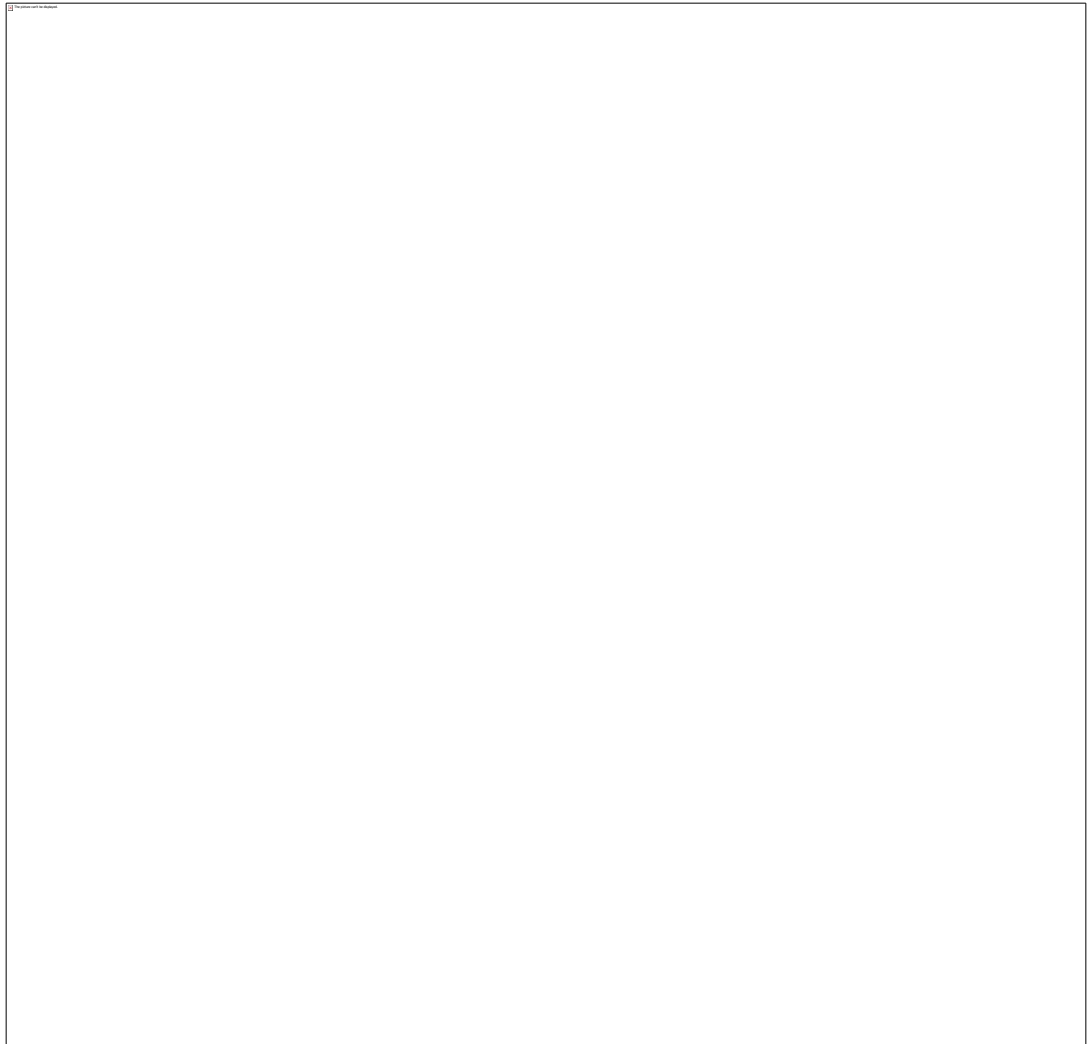


NRC Institute / Program Structure



Putting Science to Work

NRC's
collaborative
activities help
create market
solutions that
sustain our quality
of life and
contribute to the
competitiveness of
Canadian industry.



NRC Clusters



NB Cluster: Information Technology



NRC-IIT's presence in Canada

Over 276 Highly Qualified Personnel*
Located in 3 Provinces, four cities and
co-located with 3 universities
Engaged in 2 cluster strategies



e-Business Cluster
(New Brunswick)



UNIVERSITY OF NEW BRUNSWICK



UNIVERSITÉ DE MONCTON
EDMUNDSTON MONCTON SHIPPAGAN

Language Technologies Cluster
(Québec)

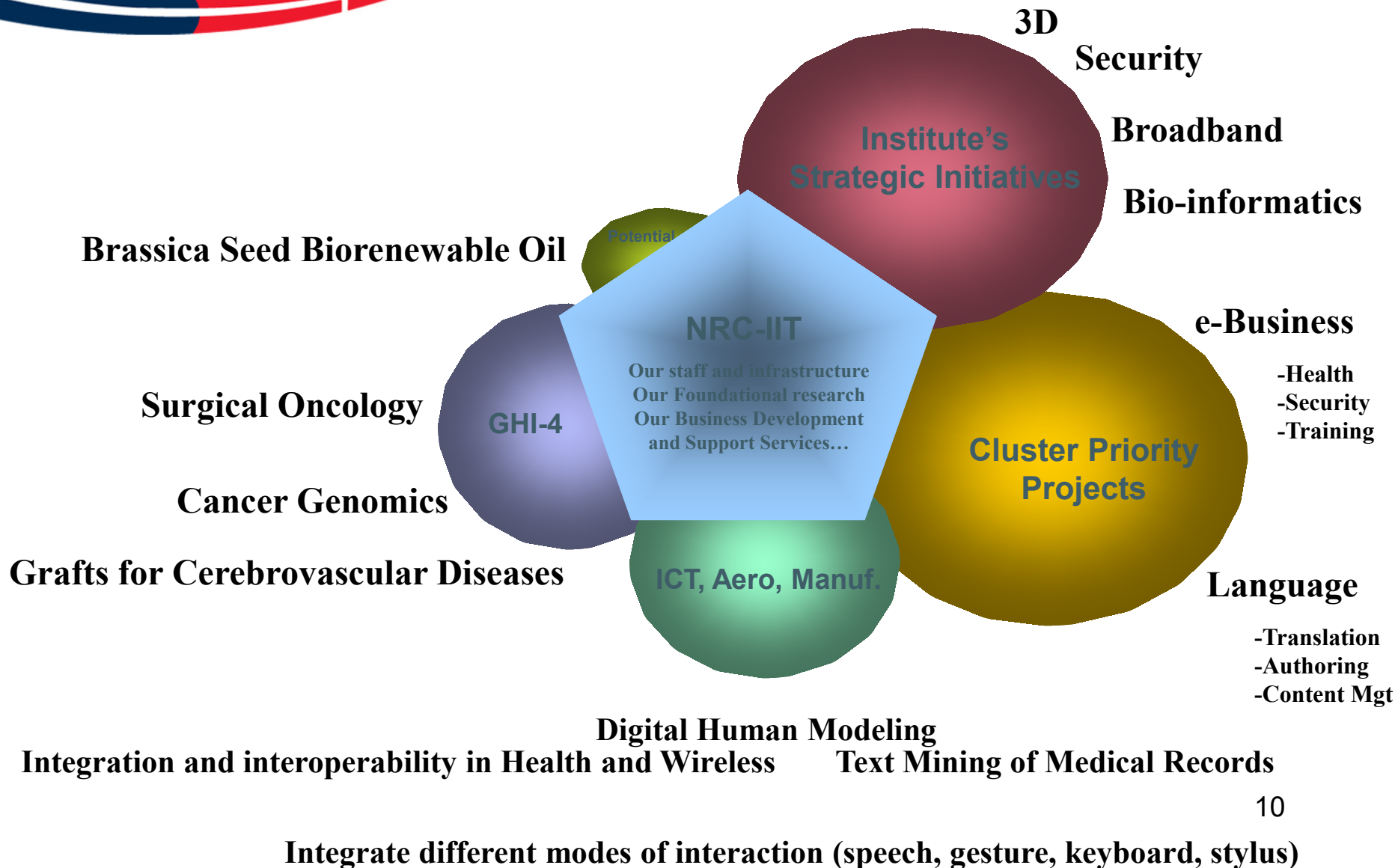


Université du Québec en Outaouais

IT Research
(Ontario)

58% of our budget is dedicated to the 2 Cluster strategies**

NRC-IIT Structure /Programs



NB Cluster Highlights

- 2000 NRC announces New Brunswick site for e-business cluster
- 2001 NRC convenes Moncton roundtable to establish research agenda for New Brunswick initiative
- 2003 Official opening of NRC Fredericton labs
- 2004 \$11 million NB/PEI research grid unveiled
- 2004 NRC opens its industry partnership facility in Fredericton
- 2007 NRC's RACOFI technology underlies Bell Canada's new independent music site, indiscover.net
- 2007 Desire2Learn announces opening of Moncton office
- 2007 NRC wins Gold Award of Excellence in Innovation at Canadian Information Productivity Awards

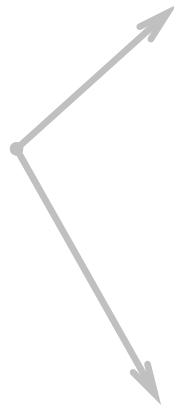
@ NRC-IIT? efficient learning and training



LCT Research

Broad R&D areas

Two main research foci



- Technologies to reduce development time for creating “learning resources”
 - How do we create better learning resources more efficiently?
 - i.e. development process improvements
- Technologies (and resources) to enhance learning outcomes
 - What is needed to make learning more efficient?
 - i.e. making content clear, usable and engaging

SynergiC³

A collaborative effort with industry and
academia

- A software framework
 - “eLearning productivity enhancement framework” to allow collaboration and consistent development
- A collaborative effort
 - D2L: Expertise in LCMS, LMS, Commercialization
 - U de M: Expertise in “learning content” creation process
 - NRC: Several R&D areas
 - DDRM, MD extraction, Learning Design, Weak Workflows, ...
 - ACOA: AIF financing (\$3M for a \$5.5M project)
- Some drivers
 - D2L: Market demands, commercialisation channels
 - Complementary expertise → Common goal, Varied objectives

- Scope
 - DDRM
 - Distributed Digital Rights Management
 - MDX
 - Automated Metadata eXtraction
 - LD | ID Accelerators
 - Learning | Instructional Design Accelerators
 - WWF | PA
 - Weak WorkFlows | Product Accelerators
- Out of Scope (examples)
 - Distributed LOR Network (DLORN)
 - Work Opportunity Billboard

LCT Research

Other initiatives

- IRET | LCT (Immersive Reflexive Engagement Trainer: DnD)
 - Combat training for soldiers for urban operations
 - currently done in live outside simulations
 - LCT role
 - Interactive learning technologies for combat training simulation
 - Multiple laser tracking functionality, Cognitive modeling for system design, HCI, User-centered design
- CEALT
 - Center of Excellence in Advanced Learning and Technologies
 - “intended to provide leadership and facilitate strategic partnerships to leverage funding for advanced learning technologies R&D, facilitate knowledge transfer, build research capacity and foster innovation in advanced learning”

@ NRC-IIT? efficient interactions



Technologies for remote collaboration

- BVC-SI (Broadband Visual Communications Strategic Initiative)
 - Research activities in Fredericton, Moncton and Ottawa linked by 3-site co-laboratory
 - Rich visual interaction technologies (video) for distributed health and learning organizations
- Peer-Generated Video: *creating innovative tools for remote interaction*
 - Remote collaboration and information sharing by video in distributed health organizations
 - Rich video content created by peers for peers, promotes interactive learning among distant locations



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This is a long video	00:00:20	Jeremy	2008-08-07

this is a long video to test out many features of the player

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Technologies for remote collaboration

- BVCam (Broadband Virtual Camera): *computer cluster for remote video recording using H.323 telecommunications protocol*
 - Recording multiple videoconferences and video clips using existing network infrastructure
 - Successfully implemented for collaborative learning in Virtual Classroom project linking high-school students real-time in 6 locations, 4 time zones across Canada
- VideoCom (northern, remote, rural, Aboriginal communities): *identifying innovation for improved communication*
 - Empirical and participatory research with remote and northern communities using video communications
 - Identifying innovative use of technology for remote collaboration, social and sustainable development of remote and northern communities



Technologies for remote collaboration

- Social Analysis of Broadband Visual Communication: *improving technologies for remote collaboration*
 - Research for more efficient multi-site videoconferences for health administrators in rural and remote communities
 - Analysis of ICT for mental health services to clients in remote locations across Atlantic region
 - Video tool for disseminating best practices for multi-site videoconferencing in rural and remote locations (community health clinics, rural hospitals)

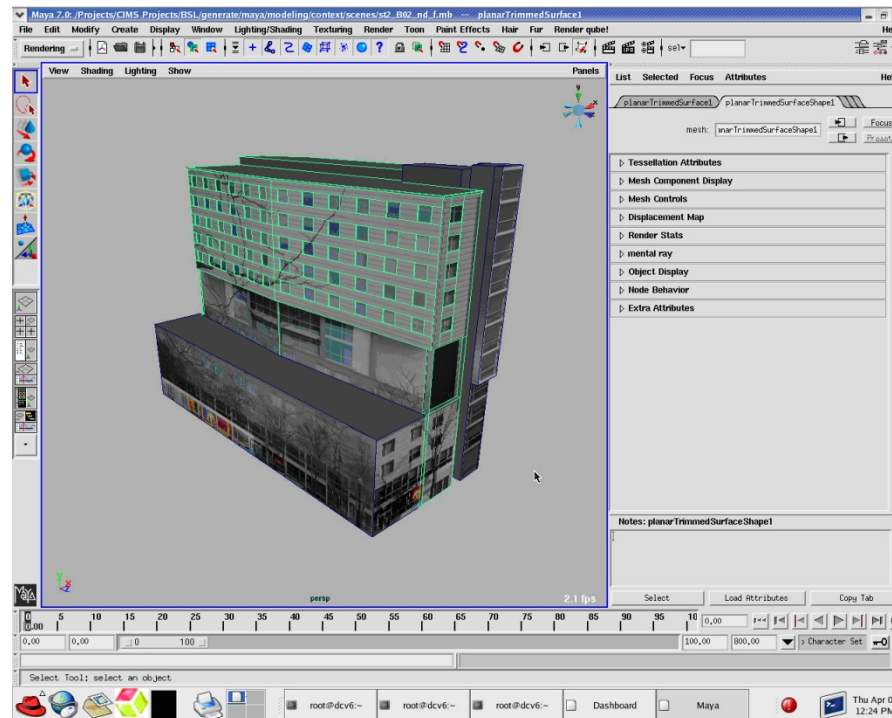


Download useful NRC-IIT publication:

Good Practice Guidelines for Participatory Multi-Site Videoconferencing

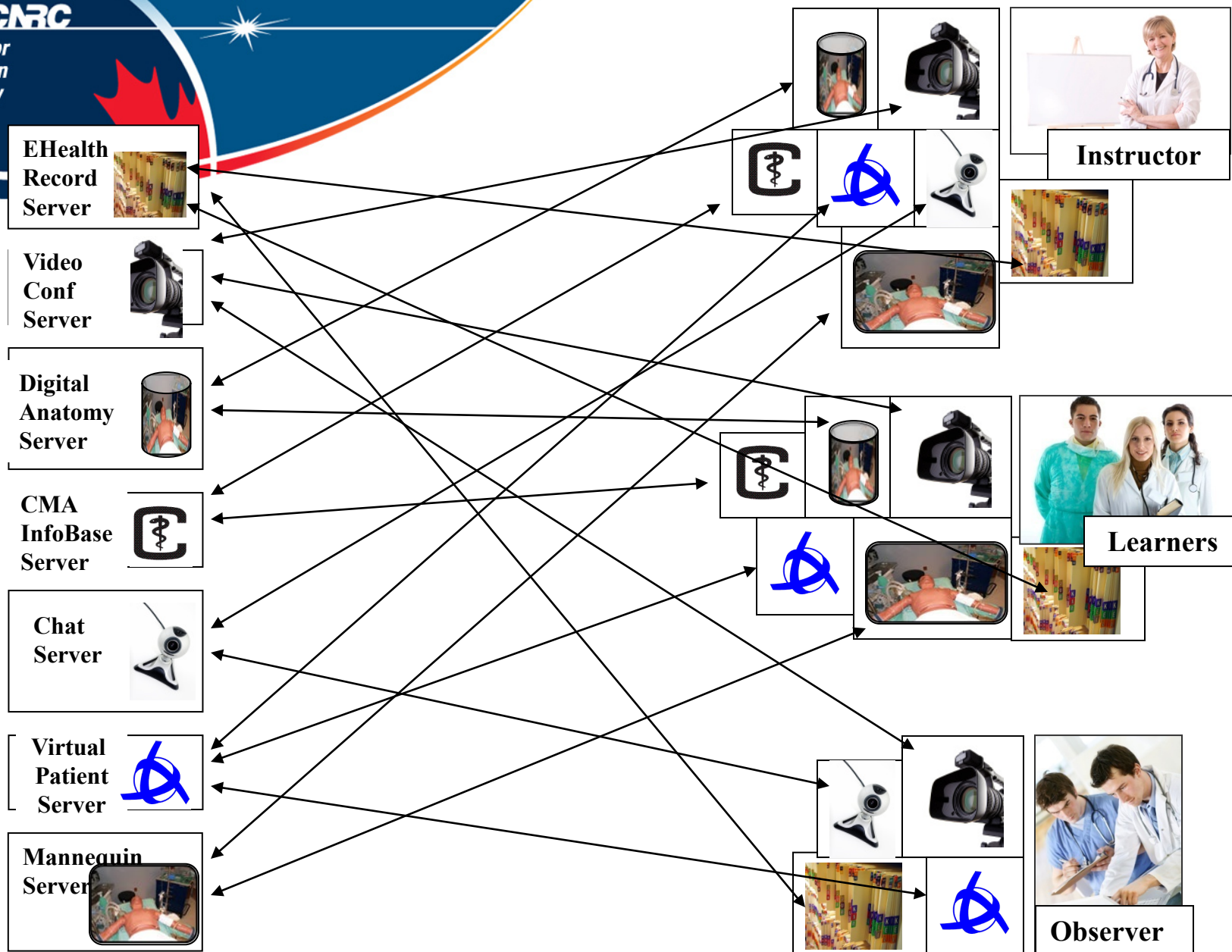
http://iit-iti.nrc-cnrc.gc.ca/publications/nrc-49869_e.html

@ NRC-IIT? efficient software systems

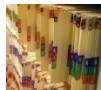


Health Services Virtual Organization (HSVO) - Mission

- A sustainable research platform for experimental development of shared ICT-based health services
- **a focused collection of functioning services supporting**
 - patient treatment planning
 - team & individual preparedness
 - in the operating room,
 - emergency room,
 - general practice clinics,
 - patients' bedsides
- **a growing Virtual Organization**
 - utilizes and contributes to expansion of the platform and services.



**EHealth
Record
Server**



**Video
Conf
Server**



**Digital
Anatomy
Server**



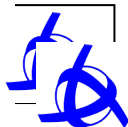
**CMA
InfoBase
Server**



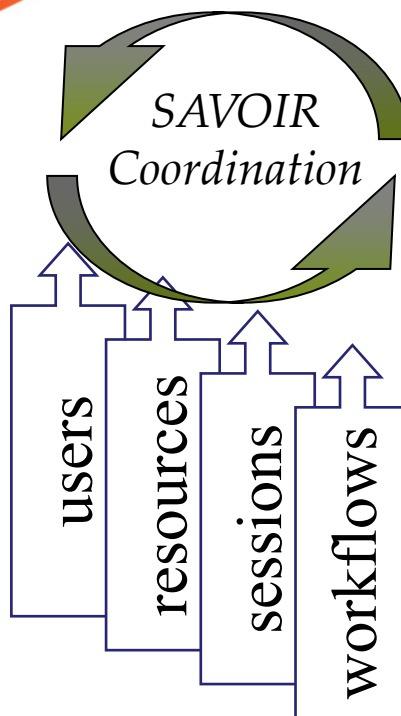
**Chat
Server**



**Virtual
Patient
Server**



**Mannequin
Server**



- **Authenticates users**
Permissions
- **Invokes resources**
Policies
- **Sessions**
Scripts, scheduled
- **Workflows**
Monitor, failback



Instructor



Learners



Observer

Mannequin control environment

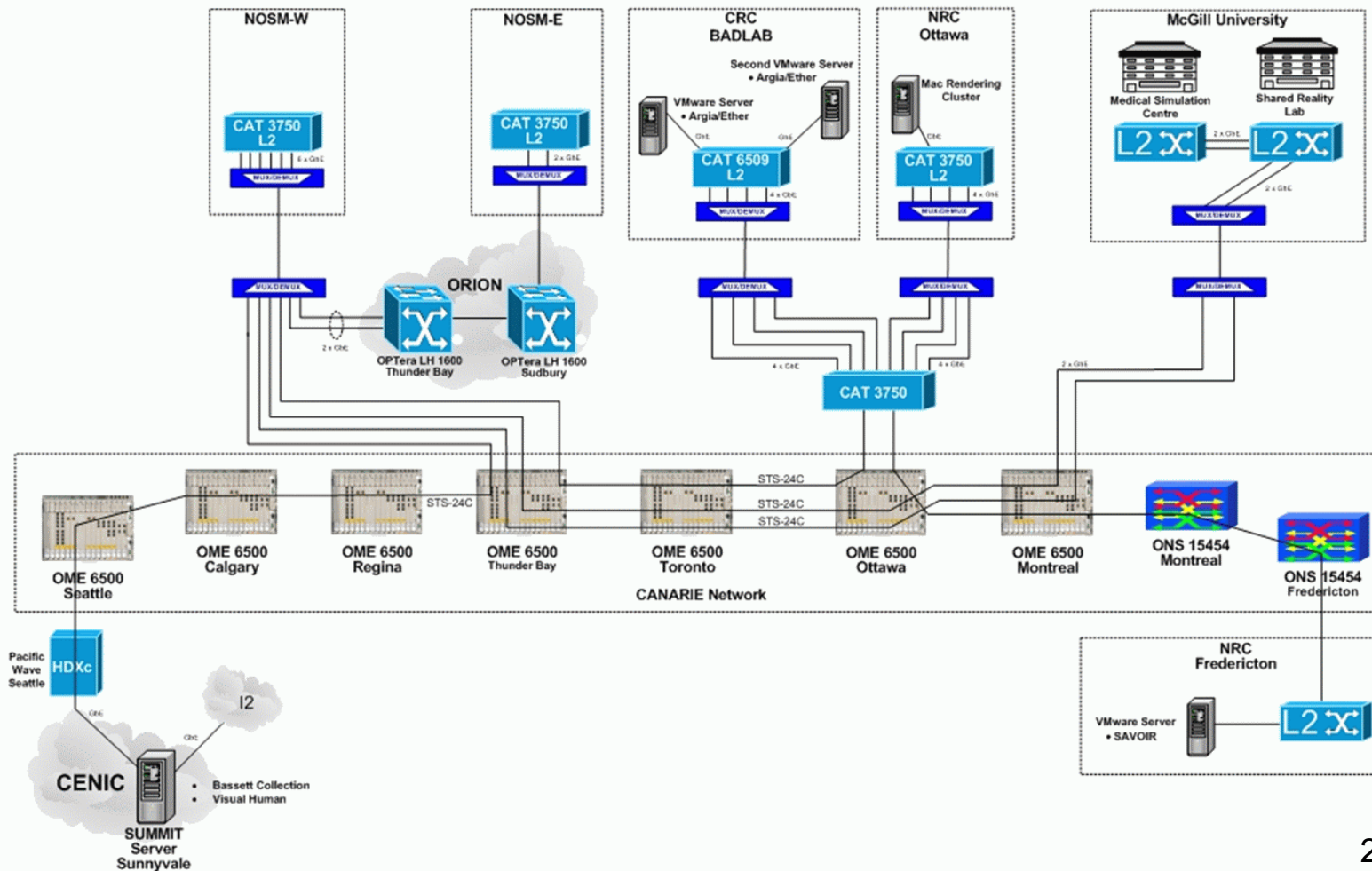


Our Results

- The user selects resources and people, then presses go
 - Integrating legacy systems
 - Wrap tools as services
 - User can create, share and install new services on demand
 - Solved!
- An optical network is just another resource
 - Lightpaths from CRC: dedicated wavelength
 - multi Gbps, no jitter
 - Solved!
- 2007 ORION Discovery award (Eucalyptus)
- Canarie
 - CIIP Project (\$1.2M completed 2006)
 - NEP Project (\$2M Sept 2008-Aug 2010)

HSVO Network

HSVO Final Physical Network



HSVO Impacts

- Health Services Virtual Organization
 - Rich media changes how we do medical training and consultations
 - Virtual patients, standard data images, 3-D data sets, mannequins
 - Virtual cadaveric dissection reduces the need for donations
 - Camera arrays so each participant can control own zoom/pan/tilt
 - Medical training and services delivered to remote centers
 - high definition, jitter free media
 - Forming Virtual organizations with multidisciplinary talents
 - Members can share own resources back to the community

“Intelligent” SOA allows the team to more freely participate in creative activity. Given this emerging paradigm of work, we must also re-think the fundamental nature of participation.

-- Michael Jemtrud, Eucalyptus project, 2007



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Science —at work for— Canada



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