



Society for Arts and Technology

## The SAT Urban Hub

*Vision, Issues and Opportunities  
and Future Direction*

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This Trend Report has been produced within the TOT project [Territoires Ouverts - Open Territories]

The TOT project is also a research network including more than 40 research and art organizations from Canada and the international community.

Its main research partners are :

- SAT (head of network)
- Université de Montréal
- Université du Québec à Montréal
- McGill University
- InterAccess
- CANARIE
- RISQ
- NRC
- Simon Fraser University
- Universitat Polytechnica de Catalunya (UPC)
- Fundació i2CAT



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# 1. Introduction

Montreal (and other metropolis areas around the world) are preparing for a creative, collaborative future. This emergent future is being driven by a restless, energetic community of individuals and groups who possess a growing sense that our culture is increasingly being defined by digital capabilities, and will be created and shaped in collaborative networks.

Around the world we are seeing the mass customization and personalization of experience, hip-hop and rap, re-mixed music and streaming video and sound represent new ways of organizing and assembling the new interconnected hyperlinked forms of digital content. Digital cinema and IPTV could gain major shares of the cultural content distribution arena in the next five years, possibly overriding it within the next 15 years: the promise of convergence, finally!

The creation, availability and distribution of digital content continues to become easier, cheaper and more ubiquitous - in Quebec, in Canada, in North America and around the world.

Indeed, Richard Florida published a book in 2003 titled “The Rise of the Creative Class” in which he outlined the factors – such as diversity, tolerance, education and certain types of infrastructural technological and socio-cultural support - that are enablers for a creative, culturally oriented knowledge-based economy and community.<sup>1</sup> Montreal was recently identified by Florida’s research team as one of three most creative communities in North America.

The evolution of the Web, wireless capabilities, broadband access, etc. over the past couple of years have created a perfect storm, wherein it is becoming apparent all around us that the inchoate promise glimpsed by the dot.com boom is becoming more real, more tangible and is finding traction in many areas of human activity. The time is now ... for acknowledging that these conditions are with us to stay, and that significant impacts and different forms of creating, commercializing and distributing cultural content are underway and offer significant opportunities and challenges.

Montreal’s Society of Arts and Technologies (SAT) is an important component of this convergent spirit and consensus. Its focus on Art & Development for the creative capabilities of the digital cultural world provides the Montreal creative digital community with an innovative window on the growing opportunities to create and introduce innovation and high-quality cultural content.

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<sup>1</sup> The Rise of the Creative Class, Richard Florida, Perseus Books, April 2002

## 2. The SAT Urban Hub - A Platform for Exploration, Experimentation and Innovation

### The SAT Urban Hub Concept

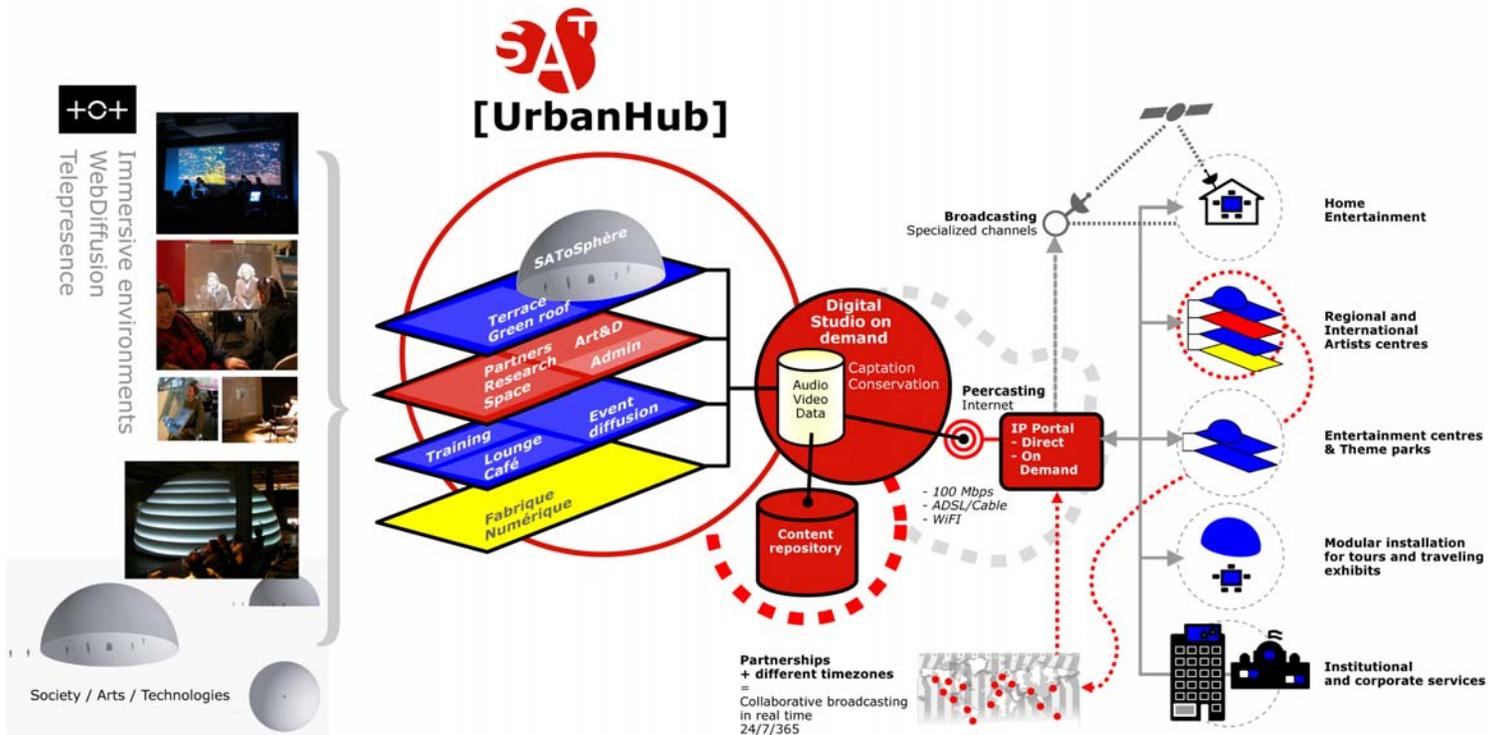
The core of the concept of an Urban Hub that SAT has been developing is to offer an open and evolving platform of leading-edge software (mostly open source), digital technology and resources for the creation, diffusion and distribution of digital cultural content. The platform will be used in an environment modeled on open collaborative networks and connected with the world.

SAT Urban Hub, which should be fully operational by summer 2006, will provide support, resources and facilities for Montreal and Quebec artists, researchers and business developers to explore, experiment and innovate with new digital technologies. Combined with broadband fiber network (FTTx) in situ, on their own or in collaboration with peers elsewhere in Canada and the world, content creators can pursue a variety of objectives, whether cultural, social, economic or of as yet undefined futuristic nature.

The SAT Urban Hub will integrate the components of creative space, talent, technology and networks to offer a positive generative capability, robustly supported by the growing pervasiveness of digital infrastructure. This integration of capability and talent will support, enhance and reinforce the positive mutations of creativity kick-started by the appearance of the Internet and Web in our lives and the growing ability to distribute cultural content easily in a fully-enabled IP environment.<sup>2</sup>

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<sup>2</sup> SAT Urban Hub Presentation

## The SAT Urban Hub Interface and Resources



The SAT Urban Hub will function as a socio-cultural and socio-economic “interface” between physical geographical space and networked virtual space. This interface will offer access to talent, knowledge, and the capability to create and distribute digital cultural content, through

- a large (12,000 square meters) and versatile multi-level multi-purpose eSpace located at the southern entrance to Montreal’s cultural and entertainment district. This location is within a 1,5 kilometer radius of more than 70% of Montreal’s IT and creative community
- high quality, high speed IP connectivity (cable and FTTx wired and wireless broadband interconnectivity)
- technological and logistic support for explorations, experiments and cultural events (types of knowledge, experts, etc.)
- residencies for researchers and artists
- access to SAT's network of more than 4,000 subscribers (primarily from the art & technology sector, with the vast majority being under 35 years)
- access to SAT's network of partnerships and collaborations with universities, colleges and research centres in Canada and the world

- living lab for beta testing digital services and contents
- high visibility and effective promotion in SAT catalogues of resources, artists and creative content

The SAT Urban Hub will demonstrate how imagination and creativity married with accessible software and leading-edge technology can serve as a vital hub for connecting with five “market segments” for specific and constantly changing needs for:

- Creative digital content in the form of images, sound, text and a limitless range of combinations
- Talent, knowledge and expertise that can help develop future generations of contribution and content
- Software, technology and services that can help any one or all of these segments to better utilize the capabilities and dynamics created by an interconnected, digital environment

The skeleton of the SAT Urban Hub vision is in place, and the trends and horizon look promising with respect to realizing the vision. SAT, through its earlier work, is already an important node in the networks necessary to continue building towards this vision. SAT is also demonstrating that it is effective as a model for the new forms of creative, collaborative, network-based dynamics, through

- its member base, a significant proportion of which represent “digital natives”
- its presence in the Montreal community of artists, researchers and the “wired tribes” of those “digital native”, and
- its modes of functioning in many different local, national and global networks of talent and creative capability

Such examples are early, leading indicators of the initiatives and mechanisms that will be the conceptual-and-content value generators for our future.

The SAT Urban Hub represents a solid and versatile architecture of space, research and development in software and technology (Art&D), and networks of members and partners that are well positioned to take advantage of these new forces.

## The Potential Markets for the SAT Urban Hub Offering

Various combinations of talent, capability, creative research and production, human behaviours and the emerging principles of a digital world are creating a rapidly-growing awareness that markets for goods and services are shifting from planned, targeted mass campaigns to attraction-driven conversations based on participative, interactive dynamics.

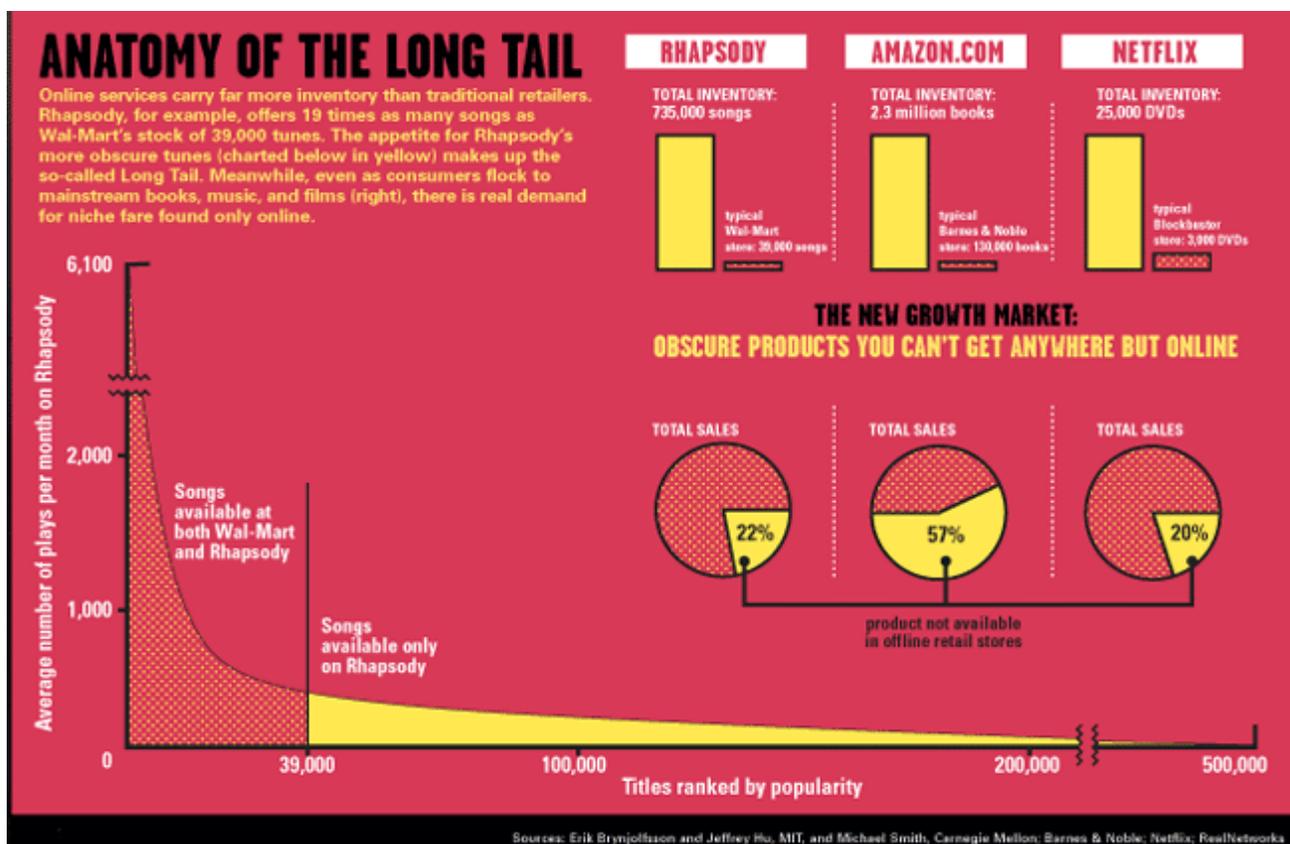
Markets enabled by accessible interfaces that search for content and distribute it instantly over the Internet are becoming markets that demonstrate the characteristics, conditions and dynamics of the bazaar, the word-of-mouth and attention-and-attraction and

network-driven means of connecting with customers and audiences (ref. Business Week article The Vanishing Mass Markets)<sup>3</sup>.

The frame of reference and dynamics of the Long Tail, and their implications, were crystallized in December 2004 by Wired magazine’s Editor-in-Chief (and patron of the famous TED conferences) Chris Anderson, in a seminal article ...

*Forget squeezing millions from a few megahits at the top of the charts. The future of entertainment is in the millions of niche markets at the shallow end of the bitstream.*

- The Long Tail, Wired 12.10<sup>4</sup>



The Long Tail is most evident in areas of activity involving digital content. Increasingly widespread broadband access, much greater ease in creating content and the ability to remix, store, share and combine digital content, is clearly leading to new market dynamics and new opportunities to access and serve many small niche markets. The physics (or lack thereof) of packaging and distributing digital content have made a potentially limitless amount of content available for individuals and markets, to serve a potentially limitless range of interests.

<sup>3</sup> Business The Vanishing Mass Market, July 2003

<sup>4</sup> The Long Tail, Wired Magazine 12.10

If we accept that in this new online networked environment for “digital natives”<sup>5</sup> a key way of building and spreading awareness about these capabilities happens by word-of-mouth, then it is essential for SAT to start, support and lead purposeful conversations with the “markets” that will help it evolve in the most useful, innovative and viable ways.

The kinds of conversations we are suggesting are the “markets are conversations”<sup>6</sup> type of word-of-mouth distribution that occurs as a result of blogging, photo-sharing or other forms of collaborative, flowing activities.

The main areas of focus in SAT’s Urban Hub architecture are in many ways “market segments” for SAT to address and approach with its range of capabilities, services and talents. This Urban Hub will be able to offer content and services to five areas of activity, or market segments, as follows:

- Home entertainment
- Regional and international artist and research centers
- Digital entertainment venues
- Location-based collaboration venues
- Corporate and institutional settings

All of the trends and evidence point to the continued growth and spread of the use of telepresence, surround sound and immersive environments in various formats or as a part of a suite of available services in these segments, whether for work, for play and entertainment or for other creative and collaborative purposes.

As is the case in almost every area of activity these days, a significant issue is how to gain attention and access.

There is a new and rapidly growing digital networked environment and a cultural transformation creating widespread new individual and market behaviours ....

## How The SAT Urban Hub Supports Peer Networks

It is clear that the presence and scope of the networked digital infrastructure will continue to grow, in Montreal, nationally and around the world. Increased availability and reduced cost of high-speed broadband access, continuing convergence of software and technology capabilities, a transforming culture and the dynamics of Long Tail markets will offer unprecedented opportunities and challenges for the creation, distribution and use of digital technology and cultural content.

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<sup>5</sup> SAT Urban Hub Presentation

<sup>6</sup> The Cluetrain Manifesto – The End of Business As Usual, Searls, Weinberger, Locke, Levine, Perseus Books, 1999

A significant number of other initiatives are occurring in similar areas of focus, wherein combinations of software, new technological capability and collaborative network initiatives are adding to the dynamics of cultural transformation and Long Tail markets. Some are operating now, others are just beginning, and no doubt many more will appear in the next few years.

SAT is involved in initiatives with various consortia and research/collaboration networks in cities around the world (Quebec, Toronto, Banff, Vancouver, Halifax , New York, Orlando, Barcelona , Amsterdam , Stockholm , Tokyo , Sydney).

As the SAT Urban Hub concept takes shape, it is important for the SAT to take a proactive approach to growing its influence and impact. The last couple of years have put the components of the SAT Urban Hub concept into place. Now it must ensure that these components provide effective and integrated support to the current and planned experiments, events and other initiatives.

In the medium term, SAT can reach out to selected areas of activity and initiatives so as to add to and refine the capabilities of the Urban Hub concept while raising its profile within networks of people who are addressing similar issues and goals.

### 3. A Living Lab for Innovation

As described earlier in this paper, the SAT Urban Hub will provide Montreal's communities and networks of emerging digital culture creators with a "living laboratory" for experimentation with high quality leading edge applications and collaborators. There are a number of important/essential constituents who participate in these communities and networks and each of them will have a different perspective on how they view the Urban Hub.

#### Technology and Cultural Content Artists

*Creators of audio, video, mixers, performance, and so on*

See it as an experimental space, leading edge technology, resources and collaboration. They can interface with peers, public and potential sponsors. They can learn how to use these new capabilities, create new ones, capture their performance and distribute them online, either as a free resource or as a source of income. In short, they can demonstrate viability and show how they can build their own economy.

#### Broadband and Network Service Providers

*Large telcos, independent community networks, network designer*

See it as leading-edge examples of the kinds of content of interest to the emerging generations of digital natives, and the ways in which these people interact with and use cultural content.

#### Digital Products and Services Developers (Montreal)

*Gaming and multimedia, next generation interface design, network devices*

See it as the possibility of experimentation with new products, and for "soft" market testing of innovative approaches and products, as well as ongoing interaction with sources of talent and knowledge

#### Universities, Colleges and Learning Institutes

*Public and private research centres, policy design and market trend research*

See it as the possibility to include independent creators and industry representatives, as well as public presentations for their experimental research projects. This can help the universities maintain an awareness of the work occurring in leading-edge digital content creation, as well as the ways in which networks of "digital natives" are interacting with that content and with each other.

### Communities, New and Emerging

*Youth-oriented network initiatives, trans-generational publications and events, open source development networks, communities and networks of digital video and sound artists*

See it as a playground for experimentation and a central physical meeting place where the human side of the network can meet, interact and collaborate. The infrastructure provided by the SAT can also help these groups or cultural entrepreneurs to access development and distribution technology that would be too costly for them individually.

### Private Sector Partners and Sponsors/Investors

*The cable and telephone companies, software and hardware companies, and companies that provide services with respect to digital content (such as television and film post-production, sound/audio studios, museum and theme park design)*

See it as a training and development opportunity on leading edge technology and software, opportunities to experiment with that technology and software, perspectives on emerging capabilities via research and artist/researcher residencies and a vantage point regarding the network dynamics of markets for digital cultural content.

## 4. Landscaping The Future

### The *Territoires Ouverts* – Open Territories Project

SAT's Open Territories (TOT) project is focused on the development of an infrastructure consisting of high-speed broadband access, sophisticated software and resources and a space that are ideal for a digitally networked cultural laboratory and generative socio-cultural, socio-economic “interface”.

Before the start of this project in 2003, SAT has also been experimenting successfully over the past 7 or 8 years at connecting and constructing relationships in networks locally, nationally and globally. These relationships build into collaborative research and development projects and collaborative events and creations.

It represents a world-class initiative that has flourished since its inception, as the digital infrastructure and associated socio-cultural shifts have continued to grow and spread.

*The Society for Arts and Technology (SAT) counts a great number of artists and creators already active in contributing to digital culture—especially in avant-garde contemporary stage arts (music, cinema, theatre, dance), interactive installations (interactive film, artificial intelligence), or network-based art (streaming, telepresence, teleoperation ...*

*... the SAT took the initiative and formed a group of researchers and creators with the goal of making broadband networks a new territory for the creation and dissemination of digital culture. This network of people brings together researcher-creators (independent, university and private sector), cultural players and institutional laboratories of both national and international importance. ...*

*... With its network of people, the SAT intends to link a regional French-speaking partnership, which includes the driving creative forces in Quebec's new media sector, with a national network of organizations that has a shared interest in the creation and dissemination of digital culture. The bridges built by such a partnership will greatly contribute to the international prestige of Canadian culture and foster exchange programs with the international centres and organizations involved in the project.<sup>7</sup>*

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<sup>7</sup> SAT Territories Ouverts – Open Territories Project Summary

## The Research Network: Territoires Ouverts – Open Territories

Initiated in 2003, the Territoires Ouverts – Open Territories research network is both a generator and incubator for projects, an Art&D laboratory and studio space and the leading environment entirely dedicated/dedicated entirely to the creation and distribution of cultural content on a high-speed broadband infrastructure.

High quality, high profile partners bring a positive contribution to the expanding capabilities in web distribution, telepresence, tele-immersion and tele-visiting. Their contributions will add to the artistic practices in dance, music, theater and cinema as well as the social sciences of philosophy, sociology, geometry and museology.

The events organized by the network of partners from ArtFutura and I2Cat (Barcelona), l'Ecole du Fresnoy (France), the InterAccess Center (Toronto), l'UQAM (Montreal) and the SAT (Montreal) have been successful, and have led to a number of requests by Canadian and International groups hoping to create or host similar events. This success has made apparent the merits of the initiatives undertaken to date, and opens the door for continued information exchange and further development of these networks.

SAT acts as the the leader of these networks and as the aggregation hub for the TOT Project initiatives, in order to distribute the network's research to a an enlarged audience. The SAT occupies a unique position between the learning institutions, industry and the independent creative worker. It acts like a dynamic agency, a living « interface » that combines accessible and versatile space with a a cross-disciplinary and cross-generational milieu for research, creative work, production, distribution, documentation at training.

From the SAT's cornerstone location at the south portal of Montreal's Quartier des Spectacles, it also participates as a cornerstone in broadband research networks that are a central part of providing high-speed broadband access to a large part of Canada's population and communities of researchers and artists internationally.

Over the next few months, the SAT and its network of partners hope to introduce extraordinary strategic capabilities and initiatives to the Canadian cultural community some extraordinary strategic opportunities.

Detailed descriptions of the research network developments is available at [www.tot.sat.qc.ca](http://www.tot.sat.qc.ca)

## Téléprésence IP

The focus on telepresence aims at facilitating interpersonal communication over distance.

Three distinct types of telepresence have been developed for interaction and dialogue: the “small “ station [TPP] for two people; the [medium] station [TPM] for small groups (3 – 15 people), and the “large” station, for audiences of hundreds of people. In all three instances, the camera is placed at the centre of the projection screen so as to preserve direct eye contact between participants, an essential condition for the spontaneity and fluidity of the exchanges.

During the coming months, TOT researchers will incorporate real time image distortion capabilities for modifying the projection to adapt telepresence to different screen geometries and textures of projection screens.

The research program also foresees experimentation with point-to-point and multi-point telepresence over longer periods and with creations that will support new adapted-to-the-event interactive settings.

### Issues and Opportunities

The issue of telepresence viability and growth has been building for some time, as the promise of combining visual communication technologies using the Internet for the purposes of connecting and collaborating has continued to evolve rapidly.

Basic telepresence is already woven into our daily lives – for example, television commentators in our living rooms is a routine part of the nightly newscast. The two-way nature of the Internet, and increasingly the enhanced carrying capability of fiber (such as CANARIE CaNet4) makes very probable the ubiquitous use of some form or other of telepresence. Fiber networks offers significant flexibility towards future expanded use of a private network, and also provides better infrastructure security and stability. <sup>8</sup>

The existing range of useful applications for telepresence technology will grow as more telepresence capabilities are developed into immersive environment forms and applications, as suggested in the section above. However, none are so prevalent or widespread as meeting with others to discuss, plan and in other ways interact with regards to purposeful activity. Much of this happens in public meetings and in the modern workplace, and the pressures for effective telepresence have only increased with the ongoing pressure to reduce costs, combined with an increased reluctance to travel, for reasons such as stress, security and cost control.

At the basic level, telepresence is ubiquitously available through the combination of a Webcam, software, visual contact projection and a connection to the Internet.

The effectiveness of telepresence increases a level of sophistication when we consider they could be mixed with the best commercial collaborative applications such as Convoq’s ASAP, Macromedia Breeze and the WebEx suite of applications.

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<sup>8</sup> Columbia (University) News, “Dark Fiber Technology Creates Faster Networking”, January 10, 2005

Home and office projectors are also playing an increasingly important role in continuing the spread of familiarity as more online presence applications are appearing on a regular basis. As the costs of projectors come down and their quality and versatility continue to increase, it's expected that these versatile portable devices will contribute in significant ways to the use of telepresence in home and office environments.<sup>9</sup>

From there the evolutionary path of useful telepresence moves up to more specialized capabilities and environments where the advantages of developing and using high-quality, expensive high resolution and bandwidth telepresence solutions are necessary, such as in the specialized contexts of research, exploration or telemedicine, for example.

SAT's current and intended capabilities represent clearly the evolutionary path of telepresence capability and use – its work in developing teleCHACHA is helping the leading-edge move towards easy, effective and highly realistic telepresence made possible in a range of environments.

This experimental and developmental work will allow its usefulness to be brought into a wide range of collaborative work and creative cultural endeavours. In the Urban Hub, telepresence will be used daily in work, conference meetings, training and live performances.

## Webdiffusion and multi-channel audio

Webdiffusion consists of application suites which offer visual creators, producers and recorders the possibility of transmitting and receiving multi-channel audio source data over IP and mixing digital audiovisual in real time. These capabilities will permit creative workers to use the network and give birth to new artistic shapes, processes and practices. A first test of this “reality mixer” between SAT (Montreal) and les Mercats des Flors (Barcelona) in September 2004 offered a show presented in Montreal in real time with musicians and vide artists present in Barcelona and vice-versa.

The project seeks to make these applications accessible as easily to the public as to the distributors of the content (for both archived and live, direct content), and also to enable the distribution of content to work even in conditions where high-speed broadband is not available.

### Issues and Opportunities

Surround sound per se (or what people refer to as the surround-sound experience) has been available to us in some basic forms for quite a while, starting with quadrasonic sound, the 4.2.4 matrix and the early THX and Dolby systems.

Michael Leader, a renowned designer and builder of some of the world's leading surround-sound systems for digital cinema and high-end homes and the founder and President of Leader Cinema Systems noted in an interview for this paper that the substantive experience of surround sound is available to many people now – the primary

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<sup>9</sup> PCWorld.com – Dell Unveils Inexpensive Projector – Growing Projectors market, August 10, 2004

issues are the quality, placement and “tuning” of the equipment.<sup>10</sup> The capabilities for experiencing high-quality surround sound for reasonable budgets will only increase from here on.

As the quality and versatility of digital home sound systems, software and speakers have gone up, and the costs of each has gone down (as is the case in every area of the digital equipment world) the demand for what is labeled and marketed as “surround-sound” is growing rapidly.

As pointed out in St’ Lukes Sensorama study, sound (and music in particular) is one of the most important components of our “felt” experience of the world<sup>11</sup> ... hence the rapid and huge popularity of the iPod, the iShuffle, MP3 players and the newest example of the re-mixable, personalizable culture – podcasting (the recording of personal expression as an MP3 and its availability by streaming and/or download).

SAT’s work on the nSlam application is highly likely to have a positive impact in the near and medium-term future, as the abilities of software to manage multi-channel sound improve and ways are found to use it in smaller systems, in streamed music over the Internet<sup>12</sup> and in more sophisticated headphones. Critical issues include the technical solutions to existing latency restrictions and backward compatibility with 7.1, 6.1 and 5.1 surround-sound systems.

For the individual and for home entertainment uses, we can expect continuing research and development of the basic elements of 5.1 and increasingly 6.1 surround sound capability to find its way into MP3 players and streamed Internet based radio.

The experimentation and development being carried out by SAT with its nSlam software and the use of sensors to interact with the sources of sound in an 8.n surround sound configuration are likely to be very attractive in the context of providing the capability to record and deliver very high quality surround sound capability for any digital sound content created using the nSlam technology.

Research and experimental development of very high-quality 8.n surround sound, and then its use for recording music and other aural content on the material produced at SAT can only accrue in beneficial ways as the penetration and levels of broadband speed increase, and as latency issues became better understood and addressed.<sup>13</sup>

SAT’s leadership in this developmental area will undoubtedly find valuable ways of being recognized and used. In the Urban Hub, Webdiffusion will be an integral part of all the networked architecture in order to enable the capture or distribution of all the public performance areas and residencies.

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<sup>10</sup> Interview with Michael Leader, founder and President of Leader Cinema Systems, February 8, 2005

<sup>11</sup> Sensorama – The New Youth Culture of Intense Experience, St. Lukes, London, UK, 2001

<sup>12</sup> [www.audiblecourses.com](http://www.audiblecourses.com) - DTS Proves High-Quality Surround Sound streaming, July 2004

<sup>13</sup> Towards The Realization of a Ubiquitous Network Society, with OECD data – M. Tabata, Sr. Vice-Minister for Public Management, Home Affairs, Posts and Telecommunications, Japan

## Immersive Environments

The research focus on tele-immersion enables the creation of coherent, realistic visual environments and immersive sound experience at a distance.

The two main approaches to immersive projection involve: 1) a single channel (hemispheric projector) and 2) a multi-channel approach that uses as many standard projectors as necessary to cover the chosen projection surface. The TOT Project's LightTWIST application enables the geometric adaptation of projections to produce a coherent and congruent image regardless of the number(s) of projectors used.

Recent developments in LightTWIST incorporate a 3D reader capable of streaming a 3D figure in real-time for three types of projection spaces: the SAT[osphere] (standard dome), the Panoscope (an inverted dome) and the cyclorama (a cylindrical panorama). The projection systems provide very high-resolution quality and are adaptable to a wide range of formats and configurations.

The audioTWIST application uses acoustic analysis and modeling to create a sonar imagery that is consistent with the actual acoustics of a space, and will serve as an interface for distributing audio in interior acoustic environments. In addition to creating sonar imagery, the audioTWIST application will generate acoustic models and parameters of sound geometry for effective audio signal correction. This will allow for navigable sonar landscapes, ambiophonic works (multiple sound sources simulation and synchronization) and virtual sound performance spaces (with audio conversation distributed amongst several participants).

The SAT[osphere], debut launch expected in the fall of 2006, is a mobile dome for projection and sound which combines the full range of the technologies developed within the TOT research programs : a mobile « hub » (inflatable half-sphere 24M in radius, estimated capacity of 400 spectators) equipped with the technologies of online digital culture, and a prototype of emerging open architectures.

### Issues and Opportunities

A range of technologically created and/or enhanced visual, aural and kinesthetic environments already exists. For the purposes of this report, let's define it as 3D or near-3D visual environments supported by surround sound and where appropriate elements of telepresence capability.

Immersive environments have been in development for some years now, and are sought after for some key purposes. The most widely known of these purposes /applications are as follows:

- Testing of sophisticated technologies
- Testing of advanced military technology
- Training for military and high-skill work
- Rehearsing high-risk exploratory, demolition or construction work <sup>14</sup>

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<sup>14</sup> Telepresence Applications, Transparent Telepresence Research Group (TTRG), <http://telepresence.dmem.strath.ac.uk/applications.htm>

And there are companies such as eLumens and Spitz Inc., which specialize in equipment such as planetarium theaters, projection domes, architectural domes and custom-designed immersive environments that provide half and full-surround domes for a range of commercial applications such as those noted directly above.<sup>15</sup>

As the theme for this report suggests, the sense-surround environment into which we are all moving means that people are becoming more accustomed to, and more demanding of the ability to have what amounts to immersive experiences in many common “places” in their daily lives ... namely, at home and at work. This desire to “feel” more of what is going on and the sense of “being in” the activity is an important, if not the core driver behind the growth in home theatres and other appliance, accessories and services that deliver or support increasingly realistic experiences to the end-user.

Examples that address this growing demand that have appeared in just the past few months are:

- The imminent arrival of the early stages of interactive TV IP, such that people can combine PVR technology with streamed TV ... sure to follow will be offerings such as Brightcove and channels that feature even closer to real-time and reality-TV like programs
- The growing availability and usability of affordable home theatres, “digital lifestyle aggregators” and personal media servers (such as Axentra’s OneBox, named CES 2005’s Best In Show)<sup>16</sup>
- The “Cell” – a powerful new microchip designed by a consortium composed of IBM, Sony and Toshiba, which will add flexibility and scalability to a wide range of systems and applications.<sup>17</sup>

The continued strong growth in popularity of computer-based games forecast by PWC adds an important dimension into this mix. Online games today are increasingly realistic, and the technology (specially-configured personal computers, with high-performance graphics and sound cards and high-quality viewing screens) used to play them is developing an increasingly “immersive” look and feel. Additionally, the uses for video game based applications are spreading, for example, into various learning and decision-making aspects of collaborative workplace applications. Finally, the demographic space is expanding, as increasing older people who are used to gaming are becoming a more important market segment.

There are several key impacts that can be derived from these trends. First, there are aspects of game-like dynamics that are beginning to be designed into many experiences where people gather for various purposes, such as to celebrate, to initiate or to carry out collaborative work. Second, more and more elements of game-like behaviour are accompanying much online activity ... whether it be Internet advertising, or meeting and

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<sup>15</sup> [www.elumens.com](http://www.elumens.com), [www.spitzinc.com](http://www.spitzinc.com)

<sup>16</sup> [www.axentra.com](http://www.axentra.com)

<sup>17</sup> What Carly Will Be Missing – High Tech Is Going Through Another Revolution ..., PBS.org I, cringely column by Robert X. Cringely, February 10, 2005

networking with people in the virtual world, collaborating for social or community purposes, or for more formal collaborative work activities.

We can also infer from these impacts that the use of the technological capabilities to create and share sense-surround digital content and experience will continue to expand, aided by easy-to-access-and-use ways of creating or engaging in such experiences.

SAT has developed significant leading-edge technical capability with its SAT[osphere] technology and expertise, with the intention of making it useful for purposes where the experience of virtual immersion provides the next step for a holistic reality-simulating involvement with objects of examination, research and testing, experimentation or treatment.

As the general costs of technology continue to reduce and the demand for realistic sense-surround experience increase, the capabilities developed with the SAT[osphere] are very likely to become more accessible and more useful to a wider range of potential users.

In the Urban Hub, artists and technicians can start experimenting and develop content for immersive environments as soon as possible. Immersive installation will be available through the main presentation area and on the roof during summer with the inflatable SAT[osphere]. During the colder periods, the SAT[osphere] will be available for regional presentations since its size and inflatable design makes it possible to go on tour in any town that has access to an interior skating rink or appropriately-sized public events facility.

## 5. SAT's Current Contribution and Future Direction

SAT has anticipated this evolution of technology and the changes that are becoming evident in the socio-cultural and socio-economic realms. With its TOT project, SAT is currently in the early stages of putting together the core components into an integrated form that will support, enhance and reinforce organic networks of creative people, imagination and technical capability. SAT is involved daily, through addressing its vision and mission, in carrying out active research and development that will serve to design, develop and capture digital content that can then be distributed to niche markets – the Long Tail – around the world.

Its vision of creative innovation – art and development (Art&D) – pulls together the design and development of leading-edge capabilities in telepresence, surround sound and immersive environments into the form of a digital hub where the talent, imagination and energy of its members and partners can design, develop, capture, catalogue and distribute digital content to emerging groups in the Long Tail spaces created by the worldwide interconnected digital infrastructure.

All of the trends and evidence point to the continued growth and spread of the use of telepresence, surround sound and immersive environments in various formats or as a part of a suite of available services in these segments, whether for work, for play and entertainment or for other creative and collaborative purposes.

The first half of this report was structured to depict and clarify that the environment at SAT in which these technologies reside and operate are “in synch” with the emerging dynamics of digital natives in an interconnected digital world – and is supportive of new generations of vibrant, knowledgeable, connected and collaborative people.

The latent sociology of connected collaborative environments initially promised by and glimpsed during the dot.com boom is now kicking in, with the attendant changes to culture, perception, behavior and activity. It seems clear that in the domain of creative cultural content SAT's TOT initiative and the SAT Urban Hub concept offer new, more mature and more concrete forms of logic and purpose that are solid, viable examples of the possibilities that were originally imagined.