

Canadian Heritage
Information Network

**Quantifying the Audience
for Ones and Zeroes**

*Analysis of Digital Art
Audiences:
Literature Review and
Methodology*

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*“Any sufficiently advanced technology
is indistinguishable from magic.”*

- Arthur C. Clarke

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INTRODUCTION AND ABSTRACT

This study is part of the federal government's Canadian Heritage Information Network (CHIN) initiative to identify the audience for digital art. In July of 2003, CHIN launched a project to explore the challenges museums are currently facing regarding the collection, preservation, research, and exhibition of digital art, and how digital art might become part of the next generation of the Virtual Museum of Canada. So far, this undertaking has demonstrated the need for more market research on the demand for digital art, as we have not found an adequate analysis of the digital art audience. Such an analysis would identify who the audience for digital art is (and thus the non-audience), as a precursor to identifying the factors that attract them to or detract them from this art form.

Étude préliminaire sur l'analyse des audiences en arts médiatiques was prepared for CHIN in March 2004 by René St-Pierre of the Université de Montréal and resulted in this current report. St-Pierre made several recommendations based on his preliminary research of digital art and its audience, including conducting an advanced literature review of digital art and developing a methodology for audience analysis. This report follows these recommendations.

To be clear, our starting point is this null hypothesis:

“There exists literature about digital art that includes conclusive audience research from which the demographics of the audience for digital art (in Canada or elsewhere) can be inferred.”

Our literature review findings refute this hypothesis. It is has also been helpful in developing a viable methodology, timeline, and budget for conducting such research. The resulting proposed method for research on the awareness of, interest in, and characteristics of the audience for digital art in Canada, can be found in the section, *Recommended Methodology for Audience Definition*.

DEFINITION OF DIGITAL ART AND PROJECT SCOPE

For the purpose of this project, we define digital art as art that uses or contains digital components or processing.

This definition thus includes works of art that use any one or combination of these media tools:

- digital photography software
- digital painting and drawing software
- video, audio, text, and/or interactivity software
- programming tools

Definition: Audience for Digital Art

We will adopt the working assumption that the audience for digital art encompasses all viewers of digital art, as defined above, and that the most active segment of that audience is the subset that actively seeks out digital art experiences.

Considerations

Our review of the literature has shown that defining “digital art” is controversial. Many people feel “digital art” encompasses all electronic media and design. Logically, this would include, for example, creative computer projects, video games, print material, software interfaces, television commercials, every Web site, and Hollywood special effects. To adopt such a broad definition would result in a definition of the audience for digital art that included all consumers of mass media, and so would enlarge our research scope to an inappropriate degree.

Fine Art and Applied Art

Taking into account CHIN’s larger overall project goals, we have made the distinction between the digital *fine* art audience (for digital art showcased in a virtual or real exhibition space) and the digital *applied* art audience (where the art serves to promote or illustrate something, such as a product, service, brand, individual, or event). Our research is focused on digital *fine* art.

Art Includes The Experience of its Audience

In conducting this research, we could choose to take a conceptual approach, in which the audience for digital art would be considered as a necessary component of the medium. As with traditionally defined conceptual art, the viewer's experience completes the work, and in the digital art case, this experience can often determine the whole nature of the art. Thus, defining the audience would then include attempting to catalogue each audience experience as well. While we could defend this approach (especially considering the often interactive nature of the genre), we have chosen to treat the audience as separate from the work, again weighing CHIN's larger project goals.

LITERATURE REVIEW METHODOLOGY

The literature review involved researching, identifying, and reviewing digital art materials from around the world, in both of Canada's official languages.

The reviewing was conducted between January 2, 2005 and February 2, 2005.

The 23 reviewed print and Web articles are published in periodicals and books or posted on the Web as PDF files or Web pages. The 37 other Web resources researched included Canadian and international Web sites: online galleries, art communities, and journals. The print articles and other resources (see *Appendix A: Literature Review Sources*) were found in a variety of locations including layers of hypertext links from Web-sites; university and college library catalogues; and online literature collections. Research also included accessing expert advice; telephone interviews; anecdotal accounts; and peer review of early drafts. A detailed list of keyword search parameters and reasons for the chosen participants is included in *Appendix B: Research and Keyword Search Parameters*.

In addition to the initial research conducted, these Canadian and international expert peers (subject matter experts and social statistic experts) reviewed this document in draft form:

- Michel Blondeau, new media director, ecentricarts inc., Toronto, ON
- Carole Charette, visual artist/designer, Trio, Québec, PQ
- Stephanie Langford, professor, University of Ottawa, Ottawa, ON
- Veronica Feihl, communications strategist, NetPotential, Toronto, ON
- Ian Lazarus, visual artist, Toronto, ON
- Marius Watz, processing artist, Unlekker, Berlin, Germany
- UCSD Economics Department, San Diego, CA

The reviewers' comments remain confidential. They did not review the final draft of the report, and they do not necessarily endorse the recommendations or conclusions provided within the report.

SOURCES OF ERROR

Very little has been written specifically about digital art in Canada. The search for digital art literature included many non-Canadian sources, as research performed elsewhere could enable us to make valuable inferences about the audience within Canada. However, since our review was limited to English and French languages, we cannot claim to have completed an international review. This limitation may be mitigated by the reality that English has become the *lingua franca* of the majority of the Web and the information technology world.

Technological change continues at an ever-accelerating rate, making it especially difficult to make lasting claims about an art form that is shaped by (and is helping shape) that very change. Furthermore, the often ephemeral and non-persistent nature of digital artwork and the nature of the supporting virtual space increase the likelihood that the truth of any conclusions made about digital art may not persist. This is, however, a new and exciting art and technological development that is becoming a huge consideration to both the artistic and academic worlds. We can participate in and benefit from the current growing discussion of digital art.

LITERATURE REVIEW FINDINGS

Our findings support the argument made by St. Pierre (2004); that a statistically-defensible demographic description for the audiences for digital art does not exist in a practical manner.

Typically in a literature review, one would provide a summary of what was said in the sources regarding the prevailing thinking or schools of thought on the issue at hand, including any conflicts of opinions. The reason we have not done so in this literature review is that no discussion on the nature of the digital art audience specifically was found in our readings.

A review of the online and print literature from Canada and international sources, has demonstrated that while the digital art form is described, profiles of its target audience and non-audience are not currently described within the literature. While studies do exist of individual exhibitions, none of these can be extrapolated significantly to accurately describe the larger digital art audience population.

We recommend that CHIN conduct formal audience research in order to establish a description of the audience for digital art.

To do so, the next step is to develop an effective, practical, and rigorous methodology to produce such a description. We have incorporated our recommendations into this report regarding a methodology for audience analysis, including budget and timeline. Once this methodology has been implemented, and the findings analyzed, CHIN will be able to better understand

- *what* attracts the existing audience to digital art, and
- *why* the non-audience is not attracted to this art form.

Recommended Methodology for Audience Definition

We are interested in developing a demographic description of the audience for digital art in Canada, as well as finding information regarding the levels of awareness and interest in digital art. While we are confident that no existing statistics regarding the audience for digital art exists, the growing academic discussion and curriculum inclusion of digital art (as well as the existence of numerous online and physical digital art exhibitions and community activities in Canada and other countries), suggest that there is an audience of undetermined size for digital art.

As per our previously stated recommendations, we have explored a variety of potential methodologies for conducting conclusive audience research that would result in a demographic description of the audience for digital art in Canada.

Due to the lack of previous digital art audience analysis, we must begin by establishing baselines by which future audience studies can be measured against. Once we have analysed the digital art audience demographic and their characteristics within the overall population, as described in the methods below, we will have statistically relevant data to correct against. This will allow for future research to be specifically conducted within, for example, the artistic community, as we will then have the tools to skew those findings in accordance with our results, making any future studies statistically sound.

There are four major technique channels of data collection for conducting such audience research: telephone, mail, face-to-face, and Internet. We considered each in turn, taking into account the information we've learned about the digital art environment.

Postal

A typical postal approach would involve sending out a survey by mail to a representative sample of Canadians, requesting that they complete and return the survey, potentially with an incentive for doing so. We eliminated this option because of its relative costliness (\$100K or more, due to the high cost of dissemination and data entry), low data quality (due to the lack of possibilities regarding the validation of the results, and uncertainty as to the real identity of the respondent), and the slow speed (the period from drop date to return alone would typically take six weeks).

Face-to-Face

There are two face-to-face methods that may work: intercepts and focus groups.

Intercepts: Intercepts involve hiring interviewers, typically working in pairs, to interrupt people and ask them to self-report in a stand-up interview. Due to the nature of the information we seek, an intercept strategy of going where digital art audience members tend to congregate (such as at an art gallery) would result in more interest and response than going door-to-door. Such an approach would be extraordinarily costly, as one would have to visit enough locations to make the sampling truly representative (perhaps \$100K to \$250K). Statistical relevance would also be difficult to establish since the very assumption as to the best intercept location implies making assumptions about the nature of the audience. Furthermore, while physical installations would make a logical intercept point, there is no corollary for online installations, and so in using this approach, we would not learn significant information about the online digital art audience.

Focus Groups: Conducting focus groups could be effective for testing potential marketing strategies directed at the digital art audience once it is known, however it is an unrealistic approach for establishing a statistically-relevant base of data, as the cost to do so would be astronomical.

Telephone

Conducting interview by telephone would involve phoning a random sampling of potential audience members and engaging them in an interview of two to five minutes in duration. Interviews with those who are not in the audience would be quite short, while interviews with those who self-identify as within the audience for digital art, the interview would continue longer, asking appropriate in-depth questions. Telephone interviews allow us to reach a broad sample quickly, relatively inexpensively, and predictably.

Internet

Internet-based surveying involves putting a survey on a Web site and then inviting people to complete the survey by visiting the site. Such surveying, because of its inexpensive and far reach, is the least expensive and easiest to administer. It also allows responses to be validated in real time, eliminates data entry costs, and substantially reduces human error tabulation cost. The downside of Internet-based surveying is that it invites substantial skewing towards those who have the interest, competency, and equipment to complete an online survey. While the online possibilities of digital art suggest that the audience we are seeking out would already tend towards participating in such an activity, and thus mitigates

error due to such a skew, the potential for skew is still substantial if this method were used alone. Therefore, it is best not to use this technique exclusively in a situation like ours where base demographic information about the population is not yet known.

Recommended Methodology

Overview

Due to our considerations and research, we suggest the following methodology. It reflects a pragmatic approach to getting the desired results. We believe that a combination of telephone and Internet surveying will give us the data quality we seek, within a realistic timeframe and budget.

Our plan is to first engage a random sample of 5,000 Canadians in major markets in a telephone survey, in order to establish basic information on digital art audience members. We anticipate that a very small proportion of the random sample will be in the digital art audience. (We have chosen a sample of 5,000 on the premise that this will yield at least 100 qualified responses. If we receive less than 100 responses, then we will not be able to extrapolate the results to the general population; in this case, our contingency plan is to increase the sample size. To support this possibility, we recommend that the research company report the proportion of qualified responses after the first 20% of calls in each region; if the proportion is lower than 2% in any given region, CHIN would be offered the choice of increasing the total calls in that region, or assuming that no responses will be found in that region by ceasing further calls in that region.)

Now armed with the basic overall demographics of digital art users, the next step would be to find an economical way to locate a substantially greater number of them. Based upon the demographic established in the telephone survey, we could purchase a list of 40,000 Canadians who match that demographic (and considering lists from memberships of organizations likely to have digital art audience as members) and who are reachable through the Internet. This group would be invited to participate in an online survey, perhaps with an inducement (such as a contest). Online surveys tend to not include those who lack the connection or the enthusiasm for the Internet (typically seniors and low-income earners). However, based upon the core demographic established in the telephone survey, we would be able to correct for the skew by matching the demographic self-reporting of the online survey participants against what we know about the demographic of the audience based upon the telephone survey.

Budget and Timeline

We have estimated the cost of performing such a research project, to include:

- consultation;
- development and design of two questionnaires;
- interviewing for first-stage survey;
- analysis and writing of report(s);
- online panel;
- online hosting of Internet survey;
- online survey setup;
- pre-testing, programming, and coding;
- tabulation

We estimate that the total cost for this project would be between \$56,000 and \$66,000 (not including GST), and thus recommend that a budget of that size be established. Such work could be accomplished at a natural pace over a six- to eight-week period, including time for client approvals. While it could be done more quickly than this, at least six weeks is advisable in order to make sure that the quality of the analysis is not compromised due to deadline pressures.

Detailed Preferred Methodology

This is a more detailed description of the preferred methodology outlined above:

Stage One: Telephone Survey

The first of two stages of research would consist of a telephone survey, which would measure the levels of awareness, interest, and participation, and the geographic, economic, and demographic characteristics of the respondents. This telephone survey would be based on interviews with a geographically-representative sample of 5,000 residents aged 16 and over, in Canada's 15 largest Census Metropolitan Areas (CMAs).

The following 15 CMAs include 18.6 million of Canada's current total population of 32 million people. The CMAs where we would conduct the telephone survey would be, from East to West:

- Halifax
- Québec City
- Montréal
- Gatineau
- Ottawa

- Toronto
- Hamilton
- London
- St. Catherines-Niagara
- Windsor
- Winnipeg
- Calgary
- Edmonton
- Vancouver
- Victoria

Urban vs. rural: In such a plan, we are working from the pragmatic premise that urban centres will show higher numbers of digital art users and that the incidence rate of digital art users would be very small in rural areas. (Optionally, to test the premise, we could add an additional 500 calls specifically to rural users, at a cost of approximately \$10,000. Our educated guess is that these additional calls would yield between zero and 10 people who would self-identify as digital art users.)

Age: We are recommending that the surveys be conducted with individuals 16 years of age or older, as speaking to those under 16 requires parental consent (which is both costly and introduces additional sources of error).

The survey questionnaire, of no more than five minutes in length, would contain questions on:

- Likelihood of being in the audience for digital art, measured by:
 - interest in visual art in general;
 - interest in digital art in particular;
 - past participation in activities or viewership related to digital art;
 - interest in participating in a panel on digital art;
- Demographic questions that could be used to determine a profile of people most likely to be interested in digital art, including:
 - education level;
 - occupation type;
 - income;
 - age;
 - marital status;
 - ethnic background;
 - Internet access and use;
 - other data collected in the course of the survey (language of interview, gender, location of residence: downtown, suburban, rovince/region).

The development of the questionnaires should be in consultation with CHIN or their consultants, and according to the final approval of CHIN.

The results of stage one would be used to derive Canadians' overall level of awareness, interest, and participation in digital art and the geographic and demographic factors most strongly associated with the likelihood of being part of the audience for digital art.

Stage Two: Online Survey

The second stage of the research would be based on an online panel survey of 40,000 adults who have the economic and demographic profiles of interest in digital art. The intention of this survey would be to obtain at least 200 completed responses. The online survey would be considered the main body of the research in terms of content.

Telephone respondents would also be polled for their interest in participating in an online panel. From that group, a subset of those who indicate their interest would be later invited via e-mail to participate. (This step allows the research company to make sure that those invited are representative of the larger population). Those whose respond are again corrected against the demographic of the larger population, to remove any skew towards those would be disposed towards completing online surveys.

The online survey would include questions that match the demographic and the survey questions from the telephone survey, and could also include additional in-depth questions, including the potentials of presenting visual or interactive material.

The objectives of this stage of the research would be to assess:

- awareness, interest and participation in digital art among a subpopulation with geographic, economic, and demographic profiles of interest in digital art;
- the level of viewership of digital art and the media used;
- the level of personal attendance at physical exhibitions, and factors that affect the level of attendance;
- the level of viewership of digital art on the Internet;
- levels of interest in the different digital art forms by showing actual examples of digital art to survey respondents (this being a Web survey, it's a natural venue);

- how respondents get information on digital art and how they communicate with the digital art community;
- level of Internet access and type of equipment used.

The results of the second stage survey would be useful in:

- understanding how to communicate with the digital art audience;
- understanding how to communicate with influencers of the digital art audience;
- understanding the level of viewership of digital art on the Internet and at live exhibitions;
- measuring the levels of preference for different types of digital art;
- understanding the different segments within the digital art community and their geographic, economic and demographic characteristics;
- segmenting the digital art community in Canada according to their interests and preferences;
- a resulting known panel who can be called upon again should there be a need to do so in the future.

Deliverables

The deliverables for the above audience analysis should include:

- a report (possibly with an intermediate highlight report following the telephone survey) based on the results of the work, statistics broken down by each of the selected demographic values and highlighting patterns of interest involving more than one variable at a time;
- tables showing results broken down by interest in digital art, region, gender, age, income, education, occupation, likelihood of viewing digital art on the Internet, and likelihood of attending exhibitions
- a data file, in SPSS format, containing results of the survey.

Appendix A: Literature Review Sources

The most comprehensive collection of digital art information found was in Christiane Paul's book, titled *Digital Art*, published in England in 2003. While this book and the many other resources cited below (including published material and Web sites devoted to the topic) do not specifically address audience demographics, they do contain useful information about the definition of digital art and the contemporary digital art environment.

PRINT AND WEB ARTICLES AND PUBLICATIONS

We believe the 23 articles and publications cited below represent a good sample of available contemporary literature about digital art. This group of authors includes academics (teachers and students), museum curators, artists, and art enthusiasts who are all concerned, in one way or another, with digital art. These sources allow for a summary of the prevailing thinking about digital art – namely the issues and conflicts of opinions surrounding the definition of the art form, the unique viewer experience with digital art and how it differs from traditional forms of art, and digital art's place within the art community.

Arden, Roy. "After Photography." Canadian Art 17.4 (Winter 2000): 48-56.

In this article, Arden conceptualizes digital photography within the sphere of art history and deems it as the return to the Realist model. He begins with a discussion of the emergence of photography and initial criticism of this form of art within the art community as the difference between reality and artist creation. He claims that "the arrival of digital technology promises to obliterate the truth value of photography once and for all" because digital art can be altered (unlike a painter's canvas) without any evidence of the change. Arden showcases five Vancouver artists involved in the creation of digital photography who have come to use photos much as a painter would use a sketch – their final work being the development and manipulation of the original "sketch" or photograph.

Binkley, Timothy. "The Vitality of Digital Creation." The Journal of Aesthetics and Art Criticism 55.2 (Spring 1997): 107-116.

This essay looks at computer art as a revolution in art that has vast cultural implications. Binkley compares digital images to analog images in terms of vitality and user impression and comes to the conclusion that digital art offers the user

more – mainly virtuality and interactivity. Virtuality is computer art’s invisible and intangible nature, allowing it the ability to change and adapt according to the medium and viewer, while at the same time be more resilient than analog media. Interactivity refers to digital media’s ability to be aware of and respond to the user, as opposed to analog media where the subject is oblivious to the viewer. This interactivity allows for unique participant experiences that the author predicts, “have only begun to be explored.”

Gladman, Randy. “Interview Rafael Lozano-Hemmer.” Canadian Art 19.4 (Winter 2002): 56-61.

This interview with Rafael Lozano-Hemmer, a popular Canadian-Mexican new-media artist, provides great insight into the Canadian digital art scene. The artist talks about Canada’s role in bringing “technology into the cultural realm.” He believes the funding and support for artists is great in Canada, however he would like to see more emphasis on the public presentation of new-media art, including conservation and collection, and observes that the European community is ahead of us in these areas (where artists are perhaps more respected as contributors to society). He believes that electronic art is just now becoming accepted into the field of contemporary art, but that we need to do more to bridge the gap between media artists and contemporary artists. The article also examines the interactive nature of digital art, other Canadian artists in the field, and the new technologies that are becoming our everyday realities.

Goldstein, Bernadette. “Pratiques et représentations des utilisateurs de musées en ligne.” Culture et recherche (102) (juillet - août - septembre 2004): 13-14.

This article discusses the audiences of online museums and their experiences, including the contrast of these sites to physical museums. While we can make the assumption that online museum site users are a part of the digital art audience, this article deals primarily with qualitative user experience with online museums, and so does not tell us a lot about the digital art audience demographic. It does however illustrate an audience analysis methodology and so therefore is a valuable resource for our current project.

Ippolito, Jon. “Ten Myths of Internet Art” Vectors: Digital Art for our Times Jan. 5, New York Digital Salon

<<http://www.nydigitalsalon.org/10/essay.php?essay=6>>.

This article is an overview of digital art including a discussion about the impact of art on the Internet. Ippolito describes the differences between what he defines as Internet art, and physical art. He defends all criticism of online art including the accusation of contributing to the “digital divide.”

Jarvis, JD. "An Art Lover's Guide to Digital Art" MOCA: Museum of Computer Art November 2002

<<http://www.museumofcomputerart.com/editorial/jdessay.htm>> Jan. 10.

This article, written by a digital artist, defines digital art as the medium upon which the art is formed (much like paint and canvas, the tools of digital art would be the software and computer). The author defends digital art as true art since: "Art is not about the tools used to make it; but in the organization of color, line, form, composition, rhythm and the interplay of all these in support of the subject matter or intent of the work itself." He shows examples of the following digital art "styles": Digital Paint and Draw (Natural Media), Digital Photography (Photo-Manipulation, Photo-Collage, Tabloid Culture), The Quest For Presence (Fractals, Integrative Digital Art). The essay concludes with a look at possible future digital art forms.

Legrady, George. Modular Structure and Image/Text Sequences: Comics and Interactive Media." George Legrady Studio Jan. 2005

<<http://www.georgelegrady.com/>>.

George Legrady speaks of his experience with interactive media and examines the future of the comic (linear) as it comes face to face with non-linear multimedia. He points out that interactive multimedia allows the user to select and sequence the events. Thus, the viewer participates in the construction of the narrative, given a limited amount of choices by the artist. In this sense, Legrady says, the viewer becomes the creator and the result of their creation is unique. If we follow this thought further, the programmer becomes the artist and the piece of art is ultimately an unordered selection of frames whose result is dependent on the user.

Lunenfield, Peter, ed. "Series Forward." The Digital Dialect: New Essays on New Media. Cambridge, Massachusetts: The MIT Press, 1999.

This collection of essays includes texts by professional artists, researchers, and scholars who "discuss and document the promise and problems of the emerging culture" of digital art. The forward of this collection outlines the theme of the book, which is concerned with the cultural impact of technology and the social implications of *virtuality*. The emphasis here is on the implications that the medium may have for the world of art, cultural ethics, our relationships with the material and immaterial, and the theories of past and present that attempt to explain the impact of technology. Unfortunately, the forward (and the included essays) do not discuss *who* is attracted to these forms of art and primarily only examine *why* we are attracted and what the effects of this attraction are and will be in the future.

Macko, Nancy. "A View of the Intersection of Art and Technology." Art Bulletin 79.2 (June 1997): 202-205.

This article describes an artist's introduction to digital imagery and what first attracted the author to the medium – namely the "speed and ease" of the technology. Digital art, however, proved to be more challenging and time-consuming because of the infinite possibilities of refinement and adjustment. The artist then turns to the economic implications of becoming an Internet artist – the cost of software, hardware, and Web space. She fears that the Internet will become completely commercial, negating the presence of the artist (and specifically the untrained artist who is not part of the "fuller enterprise"). Macko concludes with a description of the unavoidable effects of technology on art departments and the art curriculum and the need to ensure that digital work is available for teaching and commentary.

Misek, Marla. "Art and technology?" Emedia Professional Jan. 1999
<http://www.findarticles.com/p/articles/mi_m0FXG/is_1_12/ai_53578862>.

Marla Misek looks at the recent immergence of art and technology, and specifically discusses the ground-breaking art exhibition at New York City's Guggenheim Museum, SoHo in 1998, where "the artist's interpretation of physical and mental space" is for the first time combined with "the power of DVD". The author describes the organization of such an event, including the equipment and presentation of the art work where technological difficulties could make or break the artist's work – a second of unplanned black screen would be "like adding a brush stroke or two to a Picasso painting".

Mitchell, William J., Alan S. Inouye, Marjory S. Blumenthal, Eds. Beyond Productivity: Information, Technology, Innovation, and Creativity. Washington, D.C.: The National Academies Press, 2003.

This report is a result of a Computer Science and Telecommunications Board (CSTB) initiative and ensuing discussion that explores the intersection of computer science, the humanities, and the arts. The authors define the intersections between technology and art as ITIPs (IT and creative practices) and are primarily concerned with the continued exploration and development of these relationships.

Mondloch, Kate. "An Invitation to Think Again: Digital Media Revisited." Art Journal Summer 2004: 98-100.

This review of the collection of works *Digital Media Revisited: Theoretical and Conceptual Innovation in Digital Domains*, provides a good overview of current scholarly thought. The issue examined is the assessment of digital media using critical and theorizing tools from other disciplines, and whether these methodologies are adequate for the analysis of digital media. Mondloch outlines

the common themes presented in this collection of essays, which include interactivity, modern criticism and theory, the merging disciplines of art and design, and moral issues associated with the digital age. She concludes with a discussion about the intended audience of this book, namely students and scholars of social theory, and art historians who are concerned with the impact of the digital culture on the discipline of art history. In this way, digital media are “unavoidably interdisciplinary”.

Muhammad, Erika Dalya. “Race in Digital Space: conceptualizing the Media Project.” *Art Journal* Fall 2001: 92-95.

This article describes the exhibition *Race in Digital Space*, a 2001 presentation of fifty-four digital artists (film, video, CD-ROMS, etc.) that helped to pave the way for future new-media artists. These artists have used technological tools to create works of art that for the most part examine the themes of digital culture, chronicling of history, and cultural heritage. Muhammad looks at the aesthetic implications of this form of art, including the possible audience alienation technology can create and the effects of the medium’s interactivity. She concludes that this exposition succeeded in that “visitors were able to immerse themselves in the works”.

Paul, Christiane. *Digital Art*. London, UK: Thames & Hudson Ltd., 2003.

This is a complete look at the history of digital art. The author, Christiane Paul, is the Adjunct Curator of New Media Arts at the Whitney Museum of American Art in New York, the director of Intelligent Agent – a service organization and information resource dedicated to digital art – and a lecturer in the Computer Arts department at the School of Visual Arts, New York. The book surveys the development of digital art from the 1980s, to today, and looks at what we may expect in the future. Paul makes the distinction between using digital technologies as a tool (to produce traditional forms of art) and using digital technologies as a medium (to create new types of art). Although the book includes extensive theory about user experience with digital art, the author does not examine the question of audience demographics. Paul completes her discussion with a look at different themes of digital art using many digital artists from around the world as examples (see the URL below for a linked list of featured artists).

<<http://www.thamesandhudson.com/en/1/digitalartlinks.mxs?12db7dec50127753a72dd8e5daf5474a>>

Samis, Peter. “Artwork as Interface.” *Archives and Museum Informatics* 13.2 (1999): 191-198.

Peter Samis discusses viewer perception and the context of different works of art in this article. He asks the question: “how can new technologies be used to provide a bridge, a cocoon, a chrysalis from which art with new meanings can body forth?”

He outlines the challenges that face new-media - how the experience of body and object that is found with physical works of art can be achieved and improved upon with the presentation of new-media artwork. The quality and size of this form of art is limited by the privacy of the computer screen and thus retaining audience attention, while encouraging dialogue about the artwork, can be difficult. Samis concludes that in fact the potential for online artwork to provide for truly interactive viewer experience is there, although we have not yet explored all the possibilities of Internet art.

Shwartz, Gary. "Digital imagery and user-defined art - Digital Culture and the Practices of Art and Art History." *Art Bulletin* June 1997
 <http://www.findarticles.com/p/articles/mi_m0422/is_n2_v79/ai_2082425>.
 This essay examines the impact of digital imagery on museum objects. Shwartz contemplates the effects of technology and shows that most images we regard as the work of artists are in fact determined to varying degrees by the end user. The question arises then of what is the original and what is the copy (similactra). The author predicts that visitors of museums and users of digital art will have more and more control over the appearance of the image. If that becomes the case, what future do museums have when they are trying to compete with the Internet – that not only allows the user to view art from their homes, but also allows the user to manipulate their “copy” to their satisfaction? Shwartz predicts that we will see both the liberation and curtailment of user definition in art – that the museums will assert their rights to the originals, while increasing the visitors’ possibility of unique experience. This is an example of the resistance to technology and digital art – a traditional perspective that has, as of yet, failed to curtail the advancement of media art.

Soukup, Katirina. "Artists in Webby Wonderland: Rafael Lozano-Hemmer interviewed by Katarina Soukup." *ISEA Newsletter*. June-July 2002. The Inter-Society for the Electronic Arts. 10 Jan. 2005
 <<http://www.isea-web.org/eng/inl/inl78.html>>.
 In his interview, Rafael Lozano-Hemmer, a digital artist, talks about the *Annual Webby Awards*, and emerging aesthetic and commercial visions of the Internet. He describes the divide between the artists and the webmasters, between “net art” and other art and includes a discussion about the museums’ role in digital art. This interview gives valuable insight into what digital artists envision for their art and the environment within which they work.

St-Pierre, René. "Étude préliminaire sur l'analyse des audiences en arts médiatiques." Montréal: Prepared for CHIN, March 2004.
 This report is CHIN's initial initiative to define the audiences of digital art. The author observes that little has been researched concerning the audiences of this

form of art and recommends further study (including a clear definition of digital art and a comprehensive list of resources including key actors in the field), the development of methodologies and questionnaires for performing audience analysis, and a resulting planning of tactics to develop the digital art audience. Three articles are discussed: these do give some insight into the current technological and audience environment of digital art, including hurdles to overcome with any chosen audience analysis methodology.

Stein, Sarah and Edward Yip. "Mochette inception 1996." 2004 Dartmouth University 5 Jan. 2005

<<http://www.dartmouth.edu/~arthist/content/websites/website4/website4.html>>.

This essay discusses the controversial *Mouchette.org*: an interactive digital art project involving the conception of a fictional identity. The viewer experience is emphasized here, as *Mouchette.org* challenges, shocks, and confounds the user. Throughout the site, the relationship between the artist and viewer is explored, as the artist relentlessly demands viewer response and input. This essay provides valuable insights into the different elements of this controversial work and describes the themes that are explored, paying close attention to user experience.

Steinheider, Brigitte and George Legrady. "Interdisciplinary Collaboration in Digital Media Arts: A Psychological Perspective on the Production Process." Leonardo 37.4 (11 Aug. 2004): 315-321.

This articles looks at the merging of art and technology, and the interdisciplinary study and collaborating effort this form of art demands. The emergence of this "team" of specialists and artists to produce artwork, presents possible problems of collaboration and communication, the need for project management, and usually higher production costs of time and funds. The authors look at an example of such a collaborating effort and outline the hurdles to be overcome when producing art within a team environment (geographical distances, language differences, different cultural views and knowledge domains, etc.). However, the resulting product and installation proved to be a success and the authors conclude with learned lessons gleamed from working on this type of project within a team environment.

Taylor, Janet H. and Joe Ryan. "Museums and galleries on the Internet." Internet Research: Electronic Networking Applications and Policy 5.1 (1995) 80-88.

This article refutes the claim that museums and galleries are behind the times in their embracing of the Internet. The authors defend museums' efforts to have an online component to their presentation of art and provide Web sites and other resources to support their claim. This article includes a comprehensive list of online museums and galleries, as well as pertinent articles addressing this subject.

Weil, Benjamin. "Art in Digital Times: From Technology to Instrument."

Leonardo 35.5 (1 Oct. 2002): 523-526.

This article examines the cultural and disciplinary shift that is demanded by digital art – primarily the shift from marginality to mainstream. The author looks at the change in representation that is evident with the onset of new technologies and the implications of redefined and non-linear time and space. Weil describes several new media projects to support his claims concerning narrative, interactivity, information processing, and interdisciplinary connections.

Weiland, Scott. "Sense, Memory and Media" Digital Art Source: Opening the World of Digital Art 2002

<<http://www.digitalartsource.com/content/featur/feat17/feat17p1.htm>>.

In this essay, Scott Weiland examines what he claims is the not yet established discourse for describing the qualities of digital art, which is needed for critical analysis of its creation and reception. He identifies three types of aesthetic experience with digital art: digital effect (no interactive or immersive qualities), the interactive (requires some participation from the viewer), and the immersive (overwhelms the aesthetic sensibility). Each relates to the perceptions of both the artist and the viewer. This essay specifically examines the necessary relationship (or augmentation) between the medium or the technology and the actual piece of media art, paying particular attention to the user experience with both. It asks the question of how to determine where one ends and the other begins in order to accurately gauge the effects of this art form and therefore allow for critical analysis.

OTHER INTERNET RESOURCES

This selection of 37 researched sites represents a good sampling of what the Internet currently provides concerning digital art, while paying particular attention to Canadian sites. The list includes online galleries, art communities and magazines, as well as less-formal sites involved in the distribution of digital art. Some also include commentary from artists and organization personnel regarding the medium of digital art.

ADAC <<http://www.ad-ac.ca/main.asp>>

The *Art Dealers Association of Canada Inc.* (ADAC) is a national association of private commercial galleries located in Canada and “top” Canadian artists. They aim to increase awareness of visual arts both nationally and internationally.

AICA Canada <<http://www.aicacanada.com/>>

The *International Association of Art Critics* (AICA) and its subgroup, AICA CANADA, based in Toronto, “has an average of 50 members: distinguished critics, curators and scholars around the country”. They are dedicated to improving communication about visual art, specifically contemporary forms.

Applied Arts <http://www.appliedartsmag.com/about_us/homepage.html>

“Applied Arts is Canada’s leading visual communications magazine, targeting graphic designers, art directors, digital media designers, photographers, illustrators, and corporate communications professionals.”

Art Space 2000.com <<http://www.artspace2000.com/>>

This Web site, based in Manitoba, holds different types of art from around the world and includes a digital art subsection and other resources.

Artists in Canada.com <<http://www.artistsincanada.com/>>

This Web site includes Canadian artists, art galleries, and other resources.

Banff New Media Institute <<http://www.banffcentre.ca/bnmi/>>

This site describes the Banff Centre, whose mission is to encourage creativity through artistic programs, conferences and events.

Bitforms <<http://www.bitforms.com/>>

This online gallery is based in New York and showcases new-media artists.

Canadian Art <<http://www.canadianart.ca>>

This Web site houses the online faction of the *Canadian Art* magazine and includes exhibitions, galleries, and different types of resources for art-goers.

The Centre for Contemporary Canadian Art <<http://www.ccca.ca/>>

Bill Kirby is the founder of this database for contemporary art.

Computer & Digital Art <<http://www.art-in-guelph.com/Pages/computer.html>>

This Web site, based in Guelph, Ontario, features five Canadian digital artists.

Conseil québécois des arts médiatiques <<http://www.cqam.org/>>

This is the bilingual Web site of CQAM (Conseil québécois des arts médiatiques) and is designed as a meeting place and an opportunity for information exchange for those involved in media arts across Quebec.

Creative Source <<http://www.creativesource.ca/>>

This Canadian Web site aims to be “a professional directory of illustration, photography, digital imaging and design”.

Critical Art Ensemble <<http://www.critical-art.net/>>

This Web site, based in New York, is “a collective of five artists of various specializations dedicated to exploring the intersections between art, technology, radical politics, and critical theory”.

Daniel Langlois Foundation <<http://www.fondation-langlois.org/>>

Daniel Langlois is the president and founder of this Quebec-based organization concerned with encouraging the relationship between technology and art and thus foster “the meeting of art and science in the field of technologies.”

Digital Abstract <<http://www.digitalabstract.com/Index.html>>

Digital Abstract, based in Kansas, showcases digital art and artists and provides “a free, open forum for artists of all mediums” with an emphasis on the genre of digital abstract.

Digital Art Museum (DAM) < <http://www.dam.org/intro.htm> >

“Digital Art Museum aims to become the world’s leading online resource for the history and practice of digital fine art.” This Web site is affiliated with the periodical organization Leonardo, and includes essays and abstracts from the magazine, concerning digital art.

Digital Art Source: Opening the World of Digital Art
<<http://www.digitalartsource.com/pages/artist.shtml>>

This Web site contains a plethora of resources about digital art (artists, links, and recommended readings).

Emmersive <<http://www.emmersive.org/>>

Emmersive was founded by Deleon White Gallery and Napoleon Brousseau (a new-media artist based in Toronto) and is an organization aiming to explore “how new technologies can be used both as creative mediums and as subject matter”.

Film Text 2.0 <<http://www.markamerika.com/filmtext/>>

This is a digital art example that includes photography, audio, video, non-linear narrative, and text.

Fine Art with Digital Eyes <<http://www.withdigitaleyes.com/pgs/digiart.htm>>

The page “What is Digital Art?” provides a good overview of the current digital art environment and participants.

Hexagram <<http://www.hexagram.org/spip/index.html>>

This is the Web site for the Institute for Research/Creation in Media Arts and Technologies, based in Montreal. The site's mission "is to promote and support research, creation and transfer in media arts and technologies."

Institute of Contemporary Arts (ICA) < <http://www.ica.org.uk/> >

This organization is based in London, UK, and includes resources for artists, provides communication within the art community, and showcases artists in a section of “Online Art”.

Interaccess: Electronic Media Arts Centre <<http://www.interaccess.org/ia.php>>

This is an online gallery, based in Toronto, which strives for the development of an artist community in the new-media environment.

Inter-Society of Electronic Arts <<http://www.isea-web.org/eng/index.html>>

This organization is now based in Montreal, Quebec, and is “dedicated to the promotion and development of the electronic arts. ISEA is committed to the interdisciplinary and cross-cultural communication/cooperation between the arts and the fields of technology, science, education, and industry. ISEA’s activities include: organizing international symposia and local events, developing partnerships, implementing culturally diverse initiatives, publishing, and archiving”.

Jon Ippolito <<http://three.org/ippolito/home.html>>

Jon Ippolito is a writer, artist, and assistant curator at the Guggenheim. This site holds Ippolito’s essays, primarily concerning technology and art.

Lastplace <<http://www.lastplace.com/>>

A "truly virtual web art museum established in 1997 ... art for cyber sake" including a 3D museum featuring digital artist, Rodney Chang (Pygoya).

Moca: Museum of Computer Art <<http://moca.virtual.museum/>>

MOCA is a non-profit computer art museum based in New York and committed to the international promotion of digital art. This site (free to the public and to artists) includes a gallery and other computer art resources. “It tries to keep abreast of the latest and best in computer art.”

Mouchette <<http://www.mouchette.org/index.html>>

This is a very controversial example of digital art that has achieved international attention.

Nancy Burson <<http://www.nancyburson.com/index.html>>

She is a digital artist from New York who has done some very interesting work involving digital photography.

New York Digital Salon <<http://www.nydigitalsalon.org/>>

The New York Digital Salon is a new media art organization “dedicated to enhancing the understanding and appreciation of new media art and its history through a Web site, public lectures, panel discussions, computer animation screenings, and exhibitions”.

The Painter's Keys Web Site

<<http://www.painterskeys.com/letters.asp?let=040120>>

This Web site is a community for artists and posts The Robert Genn Twice-Weekly Letter. The most recent issue is entitled "Digital Art", a subject about which the author has this to say (favourite digital art quote): "By what's coming in right now, it looks to me that basement operators are doing interesting stuff. And the purists are looking down their noses. The critics are considering their navels. Some of the schools are thinking about it. As I write this letter, digital art has not yet made it into many of the Main Street galleries. Wait a minute."

Pixel Gallery <<http://www.pixelgallery.org/PXF>>

This Web site is a collaboration of the Toronto Digital Art Association (TDAA) and the Pixel Gallery. Their mission is to allow for "a non-profit network for digital artists and enthusiasts to share ideas, opinions, and experiences". They hope to broaden the digital art audience and impart information about technology and art.

Rhizome <<http://www.rhizome.org/>>

This online new media site includes a database of new-media work and critics and a newsgroup, both available to the organization's members.

Royal Ontario Museum

<<http://www.rom.on.ca/news/releases/public.php?mediakey=m8ro2k6ao2>>

The above link is a media release about The Royal Ontario Museum's Institute for Contemporary Culture (ICC) and The New York Digital Salon (NYDS) May 2004 presentation of an *Evening of Digital Art*: "a panel discussion on the emerging issues in creating, curating, and consuming digital art". This Web page includes links to online digital art galleries and other resources, including some Canadian digital artists.

Société des arts technologiques <<http://www.sat.qc.ca/>>

The Society for Arts and Technology is a "transdisciplinary centre for research, creation and presentation, dedicated to the development and conservation of digital culture." This organization is based in Montreal, Quebec.

V-Tape <<http://www.vtape.org/>>

This is a gallery based in Toronto and their Web site includes a catalogue of over 2500 independent artists' video tapes and mediaworks.

YYZ Artists' Outlet < <http://www.yyzartistsoutlet.org/>>

This is an online collaboration of Toronto-based galleries whose mission is to support the “work by contemporary artists working in all media, and to the provision of a venue for the exhibition of this work through on-going programs in both visual and time-based arts - video, film and performance.”

Appendix B: Research and Keyword Search Parameters

Expert advice, telephone interviews, anecdotal accounts, and peer review of early drafts were solicited from amongst our network of industry contacts.

The lack of clear definition concerning digital art made it effectively impossible to complete an exhaustive online search. There are many words and their combinations that could describe this art form (digital, media, art, artists, electronic, computer, Internet, technology, tech, medium, Web, design, photography, painting, drawing, software, museums, galleries, online, etc.). This study was therefore limited to keyword searches (within industry-standard search engines, library catalogues, and online literature collections) that resulted in the most relevant results:

- “digital art”
- “media art”
- “computer art”
- “digital fine art”
- “technological art”
- “electronic art”
- “Web art”
- “net art”
- “Internet art”
- “new media art”
- “digital + art”
- “media + art”
- “computer + art”
- “digital fine + art”
- “technological + art”
- “electronic + art”
- “Web + art”
- “new media + art”
- “net + art”
- “Internet + art”
- each of the above + “audience”