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KEYNOTE ADDRESS AT CANADA 3.0 FORUM,
DEFINING CANADA'S DIGITAL FUTURE
"CANADA AS A DIGITAL NATION IN THE 21ST CENTURY: THE INNOVATIVE CONTRIBUTIONS OF THE SOCIAL SCIENCES AND HUMANITIES"
JUNE 9, 2009

Premier McGuinty, Minister Wilkinson, Mayor Mathieson, Mayor Zehr, President Johnston, Conference Chair Tom Jenkins, distinguished guests, colleagues and delegates.

Thank you for that warm introduction, Ken, and let me first ask everyone to join me in congratulating Ken Coates who was recently announced as the new 2009 winner of the prestigious Donner Prize, an annual award for the best book on Canadian public policy.[1]

Ken and his co-authors received a beautiful Claire Brunet brass sculpture for their book entitled *Arctic Front: Defending Canada in the Far North.*[2]
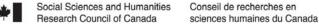Congratulations, Ken!

Introduction

I am thrilled to be back here in Stratford.

As a historian, I am deeply interested in the future.

Thinking about the future means thinking about change —
about where we have been, where we are, and where we might go.

And, in my role at the Social Sciences and Humanities Research Council, supporting research means helping build knowledge about people — ideas and behaviour — individuals, groups, societies, in the past and present, with a view toward making a better future. In other words, we are embracing the challenge of "understanding the world better" to use the title of Jim Balsillie's recent speech in Winnipeg,[3] a phrase that is a compelling articulation of the importance — and difficulty — of informed global engagement.

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[1] www.donnerbookprize.com

[2] Ken Coates, Bill Morrison, Greg Poelzer, Whitney Lackenbauer, *Arctic Front: Defending Canada in the Far North* (Canada: Thomas Allen Publishers, 2008).

[3] Jim Balsillie, "Understanding the World Better," speech delivered to the Manitoba Chambers of Commerce and the Canadian International Council, Winnipeg, Manitoba, June 2, 2009.

Understanding the world better in order to help make a successful Canada in the rapidly changing 21st century, in the developing digital age — helping imagine Canada 3.0.

To come together to focus on this challenge here in this region of Canada is so appropriate. As early as the 1970s, the University of Waterloo was emerging as a leader of international engagement with both the technology and content of the digital era. One example of this leadership was an important book published in 1977 entitled *Comphum: Computing in the Humanities*.[4]

Moreover, what better place for me to be than in beautiful Stratford, one of Canada's and the world's creative and cultural capitals, since I will talk about how deep knowledge of, and skills related to, ideas and behaviour — to people — to society and culture — are key to innovation and prosperity in the digital age of the 21st century.

Specifically, I will emphasize and illustrate today three key conclusions of current research findings:

First, that digital media are so important because they are enabling, accelerating and interacting with profound conceptual changes. These changes are now defining the early 21st century as a truly new era and they explain why the developing digital age is characterized by economic, social, cultural, and technological transformations.

Second, that researchers and students across the social sciences and humanities are now at the heart of research and innovation as digital content and the use of digital media become the focus of attention. From literature to philosophy from sociology to political science from communications to design, from law to management and education, Canadian researchers are leading global networks, in collaboration with colleagues across the campus and partners in the private and public sectors. This development reflects the new conviction that our capacity for innovation increasingly depends upon a constellation of digital technologies, digital content, and digital literacies.

And third, that the past and present ideally position Canada to play a leadership role as the first successful digital nation of the 21st century — Canada as the first nation that harnesses the power of digital media to create a prosperous and resilient economy, to enhance social cohesion by connecting diverse cultures, to build robust democratic institutions, and to foster a safe, just civil society.

This morning, I'm going to unpack these three points, providing you with concrete examples and evidence to show that "putting people in the picture," as I like to say, is the only way we can effectively move forward in the rapidly changing 21st century.

The reason I'm so excited about the opportunity to speak to you is that this conference in Stratford is putting into action the new convergence of leaders

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[4] Serge Lusignan and John S. North, eds., *Comphum: Computing in the Humanities — Proceedings of the Third International Conference on Computing in the Humanities*, sponsored by the University of Montreal and the University of Waterloo, August 2-6,1977, Waterloo, Ontario.

from all fields of knowledge and from across the public, private and not-for-profit sectors. One result is that all of us will undoubtedly come away from this experience with a deeper appreciation — and perhaps even a digital roadmap — for how universities, researchers and innovators, governments and communities can come together to help make a better Canada and, indeed, a better world.

Before proceeding, let me express a word of caution and humility about our ability to imagine Canada 3.0. Indeed, each day's headlines give increased relevance to the Swedish proverb that the afternoon knows what the morning never suspected.

Why are predictions so difficult?

Let's begin by acknowledging that the future has always been surprising. Sometimes the future is seen as an extension of the present while, in other cases, dramatic shifts are imagined in ways that underestimate the forces of continuity.

One source of disappointment has certainly been the fact that the hopes for new technology have sometimes been quite exaggerated or simply foolhardy.

Bicycles, for example, today look much more like they did decades ago than anyone predicted.

But a more common reason that the future often unfolds in unexpected ways is that people have the ability to change their thinking and change their behaviour in surprising ways.

Who knew that cars would inspire people to create suburbs, to create a new automobile culture, or to move from pride in having the biggest engine to pride in having the smallest engine?

The historic popularity of the theatre and the ability to see actors on stage when the curtain rose made many observers in the early 20th century doubt that audiences would settle for seeing people on a screen. And who knew that home movies would become so popular, or that efforts to preserve this history would become so challenging today?

Few predictions about how society would use radio, records, TVs or telephones proved to be accurate. Indeed, almost everyone agreed at the time that the birth of TV heralded the death of radio, and no one expected to see TVs hanging on walls like large 18th century paintings.

Some of you will remember how a long-distance phone call usually meant bad news since it was so expensive.

Who knew that we would come to be connected with phones in our pockets?

Seemingly unlimited messages and music — and now books and movies — whenever and wherever we want — alone or together with others — at work or at leisure.

And do you remember all those predictions about the leisure society? Who knew that the distinction between work and leisure would become so blurry that we might call our era the "weisure society?"

Or that change would be so rapid that even the media themselves would not always be recognizable across generations?

One lesson of history is that technologies become important when they meet changing ideas and behaviours, when they enable and inspire new ambitions and aspirations.

For example, versions of typewriters had slowly developed over many decades without much attention.

It was only in the later 19th century with new ideas about the organization of work — and of gender — that the typewriter became an important focus of technological development and innovation leading to the 20th century office.

But the example of the typewriter keyboard also reminds us that we may think that we are through with the past but that the past may not be through with us.

When designers configured the keyboard to make typing certain letters and letter combinations more difficult in order to prevent the keys from jamming as they came together to strike the paper, no one dreamed that the same challenging configuration would have to be met by 21st century thumbs. Only now is the QUERTY stranglehold on our behaviour being challenged by keyboardless entry.

So, when we think about change, when we think about the future, we are embracing a profound challenge. But we do need to think ahead, and not just one step ahead.

The importance of thinking ahead is certainly emphasized at this time of year in Canada. Why are some hockey players now teeing off on golf courses while others are moving closer to hoisting the Stanley Cup? Previous speakers have rightly emphasized that one key factor is a player's ability to anticipate where the puck is going. But, in addition, let's remember that only one player on the ice stick-handles while the rest of the players focus on the future.

Similarly, successful societies need lots of people — especially researchers — to think ahead as well as to address questions raised at the moment.

And, societies are no longer asking researchers only to predict the future; they are also asking them to help make the future. A future we want to live in. And it is not just a future for us, but for our descendents, and their descendents, and the generations after them.

Complexity, Diversity, Creativity

Over the centuries, successful societies have been nimble, flexible, and adaptable and they have changed in ways that build on their strengths to meet new challenges and seize new opportunities. Today, such characteristics are more important than ever as three deep conceptual changes are increasingly defining the 21st century as a truly new era: First, a new recognition of complexity; second, a new embracing of diversity; and, third, a new emphasis on creativity. Digital media are so important because they are enabling, accelerating, and redefining the significance of these key changes.

1) Complexity

Let's begin with the new recognition of complexity.

We hear all the time that the world is an increasingly complex place, and, indeed, it is. The global financial crisis that began last year illustrates the increasingly complex world as decision-makers continue to struggle to understand and act on processes that reflect values, technologies, ambitions, structures, psychologies, and policies in intertwined ways.

But equally important and of more enduring significance is the growing recognition of the reality of complexity.

The new recognition of complexity is redefining both how we think about individuals and their interactions with others.

For example, during the early decades of the 20th century in the western world, an individual's talent and prospects in life came to be officially defined by the results of a single test that resulted in a single number, the famous IQ test.

Today, no one would make this claim. Moreover, we have learned that small differences can make big differences. As humans, we may share 95 percent of our DNA with worms but that distinct 5 percent includes an infinite complexity that underpins human uniqueness.

And how differences among humans are expressed depends on context. Albert Einstein taught us that particles interact differently according to time and place. The unique and defining features of individual humans make context-related interactions infinitely more complex than particles. The trajectory and itinerary of our lives is now recognized to be multi-causal and non-linear reflecting both individual differences and group dynamics.

Our increasing recognition of the complexity of change helps explains the popularity of best-selling books with titles like *The Tipping Point*[5] or *The Black Swan*,[6] as well as the familiarity in popular culture of concepts like fuzziness or the images of butterflies flapping their wings to cause major disturbances thousands of miles away.

In this context, digital media are helping us come to grips with complexity through analytic strategies like data mining and text mining.

At the same time, digital media are themselves increasing complexity as 20th century distinctions become less obvious such as those between producers and consumers, between authors and readers, and as industrial-era definitions become contested. Who is an expert? What is authentic? Who is the owner?

In the new recognition of complexity, we now know that building the future we want is not simply a matter of technological fixes, magic bullets, miracle drugs, or easy solutions of policy or practice. Rather, we now see that, more often than not, the significance of any action or technology all depends on the relationships within which they are embedded.

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[5] Malcolm Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference* (United States: Little Brown, 2000).

[6] Nassim Nicholas Taleb, *The Black Swan* (United States: Random House, U.K.: Allen Lane, 2007).

One illustration of this deep conceptual change involves how we depict the process of innovation. In recent decades, our conceptual model of innovation has moved from a quite simple linear transfer to a more iterative model described as "chain-link" to an increasingly complex depiction that emphasizes the porous character of multiple components.

The latest version of the increasingly complex modelling of innovation has just been presented by the report by the Council of Canadian Academies. [7]

Over the years, the changing views of innovation have increasingly made clear that people, their mindsets, their intellectual assets — what economists call human capital — are central.

At the heart of this new perspective is a multi-faceted emphasis on the importance of a strong civil society, a sophisticated capacity for global engagement, and a robust array of policies and institutions to underpin domestic and international initiatives.

In other words, economic growth is no longer seen as producing successful societies in a linear way; rather, economic growth is seen as resulting from and interacting with successful societies in integrated, multi-dimensional ways to make them even more successful.

It is in this sense that our innovation capacity increasingly depends upon a constellation of digital technologies, digital content, and digital literacies in the form of talented people with a deep understanding of social, economic, and cultural complexity.

A special feature of the Canadian context is the central place of universities in research and innovation — in contributing both the knowledge and the talented people who possess "codified," "embodied" and "tacit" knowledge. Talented people who are able to make the crucial small-scale improvements in product design, in production processes, in the management of knowledge, in the types of services, in how services are delivered, how organization is managed — indeed, in all the key aspects of innovation, including social innovation — for the 21st century.

This is why the role of digital media is at the heart of the new recognition of complexity. Indeed, it is why scholars emphasize that so many of the productivity gains of recent years have been attributable to the effective use of ICTs and why Canada must do so much better.

2) Diversity

Beyond the new recognition of complexity, we are now embracing diversity in unprecedented ways. Not that long ago, the dominant metaphor for thinking about society was a cookie cutter. A successful country was seen to need a homogenous population. Public policies tried to impose a one-size-fits-all standard for ideas, behaviour, and identity.

Diversity was defined as a problem to be solved. In contrast, our era has now made clear that all societies have multiple origins, multiple identities depending on who is doing the defining and what criteria are being used. We now recognize that no single perspective can hold all the answers.

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[7] *Better Research for Better Business*, Council of Canadian Academies, May 2009.

Not only is the pursuit of uniformity often unrealistic and misguided but we have realized that sameness can lead to vulnerability. Just as we now value genetic diversity, we have come to appreciate the strength and resilience of social, economic and cultural diversity.

No one wants to put all their eggs in one basket. And no one wants all their eggs to hatch a single mindset.

As George Bernard Shaw[8] explained long ago, we trade objects and currency in a zero-sum exchange but we share ideas in an ever-accumulating enrichment for all of us. In Canada, especially, we live in multiple cultures, languages, histories and perspectives, and we address the issues that arise from this diversity everyday.

In other words, the hope for globalization in the digital age is not based on the imposition of a single model on the rest of the world. The desirable future will not follow a contest to determine superiority among cultures and societies in a zero-sum game but rather will follow a win-win effort to enhance all societies by drawing upon — increasingly through digital media — insights, evidence, and experience regardless of their geographic origins.

In this sense, digital media are now deepening and enriching robust global conversations that reflect the increased internationalization of life in communities around the world.

But — and in an unanticipated way — digital media are also reinforcing the importance of place, of context. As well as opening a virtual door to anywhere, digital connections expand and deepen connections made in physical space. Just think how much closer contact we keep with distant family members today than just a few decades ago.

At the University of Toronto, political scientist David Wolfe, geographer Meric Gertler and other team members are undertaking an international study on the role of geographic clusters — regions where firms and institutions and communities involved in the same sector tend to gather together, such as Calgary's wireless industry, the biomedical cluster in Toronto, and, of course, the software and digital media cluster in Waterloo-Kitchener and now in Stratford. This research has shown progressively that these geographic clusters are essential to success in the global economy. [9] Place matters, perhaps more than ever.

In other words, digital media are enabling, accelerating and influencing differences, as well as similarities, around the world. The promise is a stronger, more resilient, adaptable world.

3) Creativity

The third profound conceptual change that helps explain the increasing importance of digital media is the new emphasis on creativity.

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[8] "If you have an apple and I have an apple and we exchange apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas." George Bernard Shaw, *The Apple Cart: A Political Extravaganza,* 1929.

[9] "Researcher Profile Q&A," *Dialogue,* The Social Sciences and Humanities Research Council, Spring 2009.

The concept of creativity is often thought of in conjunction with the products and services of the arts, entertainment and media sectors and, indeed, the digital age is dramatically increasing and renewing their importance in profound ways.

But the concept of creativity now also includes a wide range of other activities in research and innovation in products, services and processes throughout the private, public and not-for-profit sectors.

Policies that support and stimulate creativity in ways that enhance economic productivity, competitiveness, and sustainability are now seen to be one of the keys to the prosperity of countries.

Technical expertise is now being combined with, and integrated into, contextual understandings in multi-layered ways that connect what had become known in the 20th century as distinct left-brain and right-brain thinking.

In his description of the emerging new emphasis on the whole mind, best-selling author, Daniel Pink, captures an increasingly popular sentiment when he writes that "We are entering a new age. It is an age animated by a different form of thinking and a new approach to life — one that prizes aptitudes that I call 'high concept' and 'high touch.' High concept involves the capacity to detect patterns and opportunities, to create artistic and emotional beauty, to craft a satisfying narrative, and to combine seemingly unrelated ideas into something new."[10]

The new emphasis on connecting all parts of human consciousness in the digital age is evident in our research activities, for example, a research project focused on anger management[11].

The emphasis on creativity is also increasingly evident in our curricula.

Gerri Sinclair, who is one of the world's digital media pioneers, has developed a Master's of Digital Media program at Vancouver's Centre for Digital Media that embraces the 21st century approach. "Our curriculum," she explains, "is very much focused on creativity, innovation, interdisciplinary improvisation, so the training the students receive allows them to adapt very quickly to new ideas and new situations." [12]

Creativity is also driving commercialization and social innovation in interactive ways. Indeed, customers (in the sense of users, whether as individuals or as companies) are now seen to be driving commercialization and social innovation in the Digital Age. Their ideas, tastes, and preferences make and remake the market as well as our institutions.

This reality makes clear the need to understand society, understand changing tastes and preferences, all of which can endure or change in expected and unexpected ways. In this context, one special challenge for Canada is to stay in touch with the actual end-users of so many exports.

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[10] Daniel H. Pink, *A Whole New Mind: Why Right-Brainers will Rule the Future* (New York: Riverhead Books, 2005), Introduction, pp. 2-3.

[11] Justin Carré, PhD candidate in psychology. Goals: Gauge testosterone. Manage human aggression.

[12] Marke Andrews, "Digital students say they're not worried about the future," the *Vancouver Sun*, February 17, 2009.

So, then, to begin to come to grips with the Digital Age, to imagine Canada 3.0, our researchers are telling us that the new technologies are enabling, accelerating and reshaping fundamental conceptual changes; there is a new recognition of complexity, an embracing of diversity, and an emphasis on creativity.

These conceptual changes are already evident in Canada in the rapidly changing structures of our economies, our cultures, and our social organization.

Tom Jenkins uses a historic and compelling metaphor to emphasize the profound transformation now underway. He explains that "the internet economy has thus far belonged to the toolmakers (some of them Canadian) that built the infrastructure that made the digital age possible. But the torch is being passed. The future now belongs, at least equally, to the tool users, the creative people, content providers, service deliverers, who have learned how to take the images, sounds, ideas, and concepts and share them digitally." [13]

And this transformation is a key reason why research in — and the graduates of — the social sciences and humanities are becoming increasingly important across the private, public and not-for-profit sectors.

One part of these changes has certainly involved the rapidly emerging creative industries that depend upon disciplines such as communications, fine arts and new media. Now contributing $43 billion of Canada's GDP, these industries are based on the knowledge, skill and talent of experts in design, film, and games, as well as creative services such as advertising and public relations.

But the growing creative economy is only one part of the overall profound changes that connect the Digital Age to the increasing importance of the service sector.

Ranging from banking to entertainment, and real estate to retail, these growing sectors rely on the research and competencies of the social sciences and humanities. Overall, it can be inferred that diverse fields such as economics, sociology, literature, and law influence more than $388 billion of economic activity in Canada, the equivalent of industries underpinned by knowledge based in the natural sciences, engineering and medicine.[14] In other words, successful movement forward in the 21st century depends on our ability to bring together the best of ourselves with the best that we can create.

The paradigm-shifting character of this transformation deserves emphasis.

This year, societies around the world are noting the 50th anniversary of C.P. Snow's famous description of the two solitudes of the arts and sciences. [15]

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[13] Tom Jenkins, Executive Chairman and Chief Strategy Officer of Open Text Corporation, "Infrastructure for the New Economy," http://www.cbc.ca/national/pdf/pitch_infrastructure1.pdf January 13, 2009.

[14] *The Economic Role and Influence of the Social Sciences and Humanities: A Conjecture*, The Impact Group, March 2008.

[15] C.P. Snow, *The Two Cultures,* Rede Lecture delivered at the Senate House, Cambridge, May 7, 1959. C.P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press, 1959).

While C.P. Snow would tell us today that we still have a lot of work to do, the importance of drawing upon all the ways of knowing, of bridging the two solitudes of arts and science is now a key theme of leaders across the private, public and not-for-profit sectors.

In recent weeks, for example, Indira Samarasekera, President of the University of Alberta, has emphasized that "Our support for excellence must span engineering, the natural and health sciences, and include the human sciences — the social sciences, humanities and the arts."

> The understanding of the human mind — memory, emotions, and what it means to be human — will be advanced through collaboration between neuroscience and the humanities …. Learning, culture and societies are being transformed in this rapidly changing, technologically driven world. The human sciences will be central to understanding and advancing human and social well-being in this new milieu.[16]

On the same day, Preston Manning asked compellingly:

> If it is possible — and it surely is — that the application of science, technology, and innovation to all the above challenges can have unanticipated consequences, some of them negative, is it not to the social sciences and humanities that we must look to conduct the ethical, economic, environmental, social, and legal impact assessments that will forewarn us of those negative possibilities and enable us to avoid or mitigate them?[17]

And the media recently emphasized how David Naylor, the President of the University of Toronto, was promoting 21st century thinking when he pointed out that:

> Successful societies are built around creative and well-balanced communities." "You can't have them without the social sciences, the arts and the humanities.[18]

In other words — like on the eve of the Italian renaissance in the 15th century — we're now at a critical historical turning point where we're seeing the convergence between science, technology, art, literature and culture, and it's happening right now here in Stratford.

For this reason, many congratulations are due to Ian Wilson on his appointment at the Stratford Institute. I first met Ian in the archives as we pored over manuscript documents and I cannot think of anyone with a more sophisticated understanding of the past and present as a basis for moving into the future — a renaissance man for the Digital Age.

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[16] Indira Samarasekera, "Going for Gold—Reaping the Benefits of Investments in Research," opening address, Science Day, Public Policy Forum, Ottawa, Ontario, May 27, 2009.

[17] Preston Manning, "Stimulating an Ailing Economy: The Crucial Role of Science, Technology, and Innovation," keynote address, Science Day, Public Policy Forum, Ottawa, Ontario, May 27, 2009.

[18] David Naylor, "Universities and the Innovation Economy: Reflections from Toronto," speech to the Economic Club of Canada, Toronto, Ontario, May 14, 2009. Quoted in Elizabeth Church, "Social scientists to press Ottawa for more funding," the *Globe and Mail*, May 25, 2009.

Digital Research Excellence

Now, let me illustrate how scholars in fields like history, philosophy, literature, sociology, political science, geography, communications and, indeed, across the social sciences and humanities are not only addressing the key questions of our era but also using and creating digital media to help Canada move forward successfully in the maturing 21st century in the spirit of the Canadian Research Knowledge Network, which is taking the first steps to build a digital library for all of us.

Paul Messinger, a professor at the University of Alberta School of Business, is leading a nationwide study of buying and selling practices on the Internet. He and his team are gathering critical data about how customers are attracted to e-commerce web sites, how they interact with those sites, how they make orders online and what kinds of service experiences earn customers' loyalty. Based on that understanding, Messinger is making recommendations to Canadian businesses, customers, charitable organizations and government associations and is helping improve Web management and e-commerce competitiveness in Canada.

David Lyon is director of the Surveillance Project at Queen's University where he works with an international team to examine how growing computer dependence and reliance on personal data collection has raised public concern about privacy and civil liberties.

In other words, Lyon and his colleagues are detailing the social consequences of being monitored — from the benefits, such as ease of purchasing, to the perils such as identity theft.

University of British Columbia professor Luciana Duranti heads the InterPARES project, which has developed strategies, policies and standards for preserving authentic digital records. China has already adopted InterPARES authenticity requirements as law. European financial institutions have approached the project for assistance in ensuring the authenticity of bank transactions. And Duranti's students are sought after by institutions around the world, including Hollywood.

Scholars are also using digital media to transform the familiar approaches to the study of history and culture. Steven High, a professor of history at Concordia University, gathers personal oral histories of transformative social events that deeply affect communities. The oral accounts are digitally recorded and stored at the university's Centre for Oral History and Digital Storytelling. Working with 15 community partners representing Montreal's diverse immigrant communities, as well as a range of heritage, human rights and education agencies, the centre provides technical and research training on campus and in the community.

Such digital work has been accelerated by the increasing availability of digital content especially, for example, in the recent establishment of Research Data Centres across Canada. By making available social and demographic data often related to key health issues, the Canadian Research Data Centre Network is enabling more and more research projects and involving more and more researchers and students. The network is being recognized internationally as a model of building capacity and knowledge sharing, although we still have so far to go.

Ray Siemens, Professor of English at the University of Victoria, is working with colleagues to build new knowledge environments. He and his team are studying

how digital technology is enabling us to change in fundamental ways how we relate to writing, reading, and the human record itself. His research shows how the pace of that change has created a gap between our cultural and social practices that depend on stable reading and writing environments, and the new kinds of digital artifacts — electronic books being just one type of many — that must sustain those practices into the future.

His project is documenting how people experience information as readers and writers and he is integrating that knowledge into the design of new electronic interfaces of rich media which enhance their experience.

And Siemens and his colleagues are helping build capacity through the important Digital Humanities Summer Institute at the University of Victoria.

Stéphane Bouchard at the Université du Québec en Outaouais is forging Canada's reputation as a world leader in the emerging field of cyberpsychology, which includes issues like social anxiety, pathological gambling, schizophrenia and post-traumatic stress disorder. Dr. Bouchard's research focuses on the use of virtual reality and telepsychotherapy delivered through videoconferencing to prevent and treat such anxiety disorders.

To promote this kind of innovative research, our team at the Social Sciences and Humanities Research Council has recently launched, in collaboration with American and British partners, the "Digging into Data Challenge." We are challenging researchers to come up with novel ways to tap into the digital data repositories around the world to enable new research opportunities and to promote international linkages.

Another feature of the new research initiatives is the redefinition of the curriculum. John Bonnett at Brock University is developing the 3D Virtual Buildings Project, in which university students generate models of historic settlements using 3D modelling software. This work, along with that of Kevin Kee, who is a cultural historian developing history simulations and serious games, are transforming what it means to be a student in disciplines like history. Examples here include Jill Goodwin at the University of Waterloo's Canadian Centre of Arts and Technology, who looks at knowledge transfer and commercialization, and how digital display technology can be applied to the theatre and performing arts. Delegates here at this conference have the chance to learn more about her exciting work.

One final example is the Shared Hierarchical Academic Research Computing Network (SHARCNET), the regional high performance computing consortium of southwestern Ontario universities that is helping bridge the campus through initiatives such as the Digital Humanities Fellowship Program.

I could go on and on about the exciting and innovative research now underway across Canada but let me conclude our session this morning by suggesting why we should be optimistic about our ability to take action, to make Canada succeed in the 21st century.

This optimism is based on an understanding of why Canada became internationally recognized as one of the most successful societies in the world by the end of the 20th century.

Why? Some have assumed that our natural resources explain this success. If this factor is so important, what about other resource-rich nations that have not fared as well?

Some have said our location next to the United States has put us in a can't-miss position. If so, what about other U.S. neighbours?

Instead of these explanations, I think that the evidence shows that the story of Canada as a successful society is based on a distinctive Canadian conviction: that the building of a successful society depends upon public investments in the advancement of knowledge and understanding, and the development of talent as a public good.

Indeed, it was Canada that took to heart the ancient Chinese proverb about the value of investing in learning. "For a return in one year," the proverb says, "plant corn; for a return in 10 years, plant a tree; for a return every year forever, invest in education."

Rethinking Canada's success thus far provides the necessary background, I think, for coming to grips with the 21st century.

Chapter 1 of this story tells of the establishment of common schooling during the 19th century across all the provinces that became part of Canada in 1867. Overall, Canada became one of the world's most literate societies during the 19th century despite considerable periods of economic uncertainty, political instability, substantial migration, and competing internal and external pressures. The result was that Canada developed a remarkably successful commercial agricultural economy supported by a resilient civil society.

Chapter 2 continues this story but now emphasizes the emergence of public universities in the late 19th and into the 20th centuries. These universities remained small but they produced the professionals that enabled the growth of the institutions, services and industries characteristic of modernity. By the mid-20th century, Canada had emerged from two world wars and the Great Depression as a politically sovereign country visible on the world stage; Canada's intellectual assets and human capital played a central role in determining this experience.

Chapter 3 then describes how Canadian higher education developed rapidly after the 1960s, as illustrated by the increasing number of degrees awarded during the 20th century. During these decades, Canadian participation rates at the undergraduate level rose to the top of the international standard. At the same time, the increase in master's and doctoral enrollment was much slower. The result of the unfolding of these patterns has been complex.

But one significant development during this Chapter 3 period was the building of a made-in-Canada research community. When Canada embarked upon reconstruction following World War II, Canadian universities were predominantly staffed by professors with graduate degrees awarded by foreign institutions and they offered courses mostly based on imported instructional materials. While Canadian scholars did play a leadership role in some research areas, campuses were more intellectual colonies than robust realms ready to help Canada recover and rebuild in the post-war era.

Over the past 30 years, the remarkable emergence of made-in-Canada universities has been based on a new partnership between the provinces and the

federal government. While the provinces have maintained primary responsibility for educational programs in keeping with the British North America Act, the federal government has taken on the leading role in supporting top-quality research and research training.

Federal research initiatives have helped produce universities with vibrant undergraduate and graduate programs and robust research activities. Such investments have proven to be crucial as other countries have increased their own public support for research.

The jurisdictional partnership has meant that our universities have become truly made-in-Canada as well as being connected internationally. This dramatic change is illustrated in the increase in applicants for Social Sciences and Humanities Research Council research funding during the 1970s and 1980s who had received graduate degrees in Canada. Overall, we achieved intellectual sovereignty during these years.

The result is that, today, universities from coast to coast are contributing in unprecedented ways to the increasing demand for talented graduates, new knowledge and interpretations of the past and present, and new ideas and strategies for building successful societies. But the new challenge is that economic, social, and cultural expectations require greater knowledge creating the need to expand our graduate programs and increase our research intensity.

In this context, becoming a digital culture, with ready access to Canadian content (historical, contemporary, economic, social, and cultural) is increasingly essential. And learning how to use, assess, and manage digital content now underpins national success. For these reasons, Canadian content must be digitally collected, preserved, and made accessible to business, education, government and society at large.

The urgency of these issues is reflected in the research findings which show that the digital divide has been increasing, particularly since the late 1990s. This divide reflects global differences evident at the level of continents in satellite photos.

But the digital divide is also apparent domestically, even within communities. For some, digital media are a great enabler and path to great opportunities, but for others, including parts of small-town and rural Canada, and for disadvantaged groups in all communities, digital media are not always generating a sense of optimism.

Concerns about the digital divide are not simply about connectivity, but more importantly, they are about digital content and digital literacy.

Global awareness of these issues inspired the first World Social Science Forum, which attracted hundreds of delegates from all corners of the earth last month in Bergen, Norway, under the theme, "One Planet — Worlds Apart?" [19]

Conclusion

Will the 21st century be the one that really belongs to Canada? Or, in the Digital Age, is Canada at risk of becoming a colony again — this time a digital colony?

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[19] www.rokkan.uib.no/wssf

How can we ensure a comprehensive presence of Canadian content on the digital world stage? How can we make Canada 3.0 a robust digital nation, globally engaged, contributing to international success in the 21st century?

By seizing the digital opportunities, we can also showcase Canadian content to the world, so much of which is internationally acclaimed — from literature and artistic expression to public policies on multiculturalism and financial institutions, from education to urban planning and on and on.

But Canada is not alone in imagining how to build a successful future. Countries big and small are working hard to embrace the new era including those on the other side of the world. For example, *Creating Digital New Zealand,* a discussion document, was published almost three years ago.

But Canada has key advantages. Not only is Canada a world leader in broadband penetration but talented Canadians — like you here today — are not just seeking information, they are using and reusing it, interacting with it and with others about it, they are seeking to manipulate and comment on it, to rework it to create new content.

And, as Canadians, we can draw inspiration from the world's pioneers of our new era, some of whom are only now being recognized for their work in creating what has become the intellectual foundation of the Digital Age.

A few years ago, Harold Innis was ranked as among the top three Canadian thinkers of the 20th century and his study of the fur trade was chosen as the best Canadian non-fiction book of the century[20]. But, in fact, this scholar of political economy, communications and culture during the first half of the 20th century, is now increasingly recognized — thanks especially to the research of John Bonnett[21] — as a world leader in anticipating and thinking through the profound transformations that we are now experiencing in the Digital Age. Indeed, the insights of Innis helped construct a conceptual foundation for current work on emergent properties, complex adaptive systems, and the key role of media in the development of civilizations.

And his influence on international figures — including other Canadians such as Marshall McLuhan — has been enormous. In fact, McLuhan wrote, "I am pleased to think of my own book *The Gutenberg Galaxy* as a footnote to the observations of Innis on the subject of the psychic and social consequences, first of writing then of printing." [22]

Indeed, the world is now beginning to recognize a distinctly Canadian way of understanding communication and the importance of communication technologies.

Let me conclude by emphasizing that we must admit that despite promising signs and the reality of our potential, it remains true that Canadians are not taking full

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[20] Peter C. Newman, *Maclean's*, February 1999.

[21] John Bonnett, *Communication, Complexity and Empire: The Systemic Thought of Harold Adams Innis*, University of Ottawa, PhD thesis, 2002.

[22] Marshall McLuhan as quoted in Kathleen E. Garay, in Kelly Boyd, *Encyclopedia of Historians and Historical Writing* (Taylor & Francis, 1999), p. 752.

advantage of the digital opportunities, whether on our campuses, in our businesses, in our communities, indeed, everywhere. We can and must do more.

That is why this gathering here in Stratford is so important.

But on the path to creating the future we want, we must first cross the threshold of the imaginable.

In other words, we must first recognize the challenge and opportunity of nation-building in the 21st century.

David Johnston, President of the University of Waterloo, who has played such a key role in the making of today's higher education landscape in Canada, has succinctly emphasized how the Digital Age calls upon us to connect campuses and communities in order to re-imagine Canada. In his words, "Those communities who best harness and enhance their knowledge and create a climate for innovation will best succeed. And the best place to start is with the learning institutions in each community across the land. And from each of these community successes we build a better country." [23]

Can Canada become the world's first digital nation and therefore a truly successful 21st century society?

Who better? We have the technology, we have the know-how, we have the talent, but do we have the ambition? The courage? Can we dream?

Canada's history says yes. Indeed, the construction of railroads as a nation-building project of the 19th century provides an apt metaphor to describe the challenges and opportunities of the Digital Age.

Certainly, late 19th century nation-building in Canada involved railroads tying together the new country. But the last spike was only the beginning. Indeed, it was not the tracks or even the trains that made Canada; rather, it was the content they carried — the people they carried — those who built the schools, businesses, and communities across Canada.

In the same way, the digital infrastructure of the 21st century includes not only the digital tracks but also the digital trains carrying information, ideas, commodities, and identities, connecting us — enabling us — in new and profound ways.

Can we make Canada "the most information rich and information literate country in the world?" Can we be successful in "identifying, valuing, and preserving our digital information assets?" Can we "use these assets to educate our youth, to foster a common cultural identity and pride in our accomplishments, and to create new knowledge and new products that advance our economy?" Can we provide ubiquitous and democratic information access for all Canadians to "support our common goal to live in an inclusive and progressive society?" [24]

Yes, Canada's history says. The future is ours.

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[23] David Johnston, "The Waterloo Way: From Knowledge to Innovation," address to the Canadian Club-Indo-Canada Chamber of Commerce, April 9, 2001, Toronto, Ontario.

[24] *The Canadian Digital Information Strategy*, Library and Archives Canada, 2007.

In collaboration with our researchers and partners across all sectors of society, let's make the future we want. Let's make Canada a successful digital nation in the 21st century.

Thank you so much.