Design for our times: workshop 1: design in the 21st century
Diamond, Sara; De Ridder, Justine; Hassan, Khalid; Emond, Bruno

For the publisher’s version, please access the DOI link below./ Pour consulter la version de l’éditeur, utilisez le lien DOI ci-dessous.

https://doi.org/10.4224/40002667
Design the 21st Century

Design for our Times: Workshop 1

Dr. Sara Diamond, May 19th 2021
WELCOME

Dr. Sara Diamond
President Emerita OCAD University

Justine De Ridder
OCAD U Strategic Foresight and Innovation Graduate Student

Khalid Hassan
OCAD U Environmental Design Undergraduate Student

Dr. Bruno Emond
Senior Research Officer, NRC
Zoom instructions

This meeting is being recorded.

You can enable automatic close captioning.

Use the chat to ask questions and make comments.

Message one of the assistants if you have issues.

Q&A: Use the chat or raise your hand
Why design for our times?

Design for our times will acquaint NRC scientists with a valuable toolkit.

Design research and practice could strengthen the NRC’s role as an engine of economic, environmental, and social transformation.

Design provides important skills to build back better after COVID-19.

Contemporary design engages across the spectrum of human diversity.
DESIGN EXERCISE
Close your eyes for a moment
All of these objects are designed
What need is your object filling?  
*User Centered Design*
Who was it made for?

Persona
Who uses it now?

Persona
What role does your object play in your daily life?

Experience Design
What is its form?

*Functional Design*

Photo by Ehsan ahmadnejad on Unsplash
Do the aesthetics say anything about its brand?
What material is it made from?

Source: https://nrc.canada.ca/en/research-development/research-collaboration/research-centres/aerospace-research-centre
Is it made from recycled or reused materials?

Sustainable/Circular Design
How would you improve it?

Concept Design
Sketch your idea!

Design Prototype
LET’S SKETCH!
Everything is designed
Everything is designed

Design is the way we create products, services, and systems.
“Products and services do not exist in isolation, they represent the individual, social, and cultural experiences that they engender and the value and impact that they have on others.”

Bill Buxton

Design is ubiquitous and often invisible
INSPIRATIONAL CANADIAN DESIGN
Let’s talk about Roots!

Roots store on Bloor St. in Toronto by Roots Corp.
Source: https://www.thestar.com/life/fashion_style/2013/08/07/roots_takes_journey_through_decades_of_fashion_for_40th_anniversary.html
Everyone has roots and values them.

Everyone’s roots are distinctly their own.

Roots stands for pride in our origins and history.

Roots represents what is distinctive about ourselves.
Born in Canada, Loved Worldwide

Our birthplace may have been in Algonquin Park, but we unite the best of cabin and city globally. We have over 120 stores across North America, more than 150 internationally, and we offer online shipping to over 70 countries. You can always find Roots, no matter where you are.

OUR FLAGSHIP STORES

STORE LOCATOR

Let’s talk about Roots!

Roots is a design driven company

“Responsible for managing the process from conception through to production, the Roots design team stays true to the spirit and values of Roots in creating any new product”
Make It Your Own

Customize your very own Roots Award Jacket or leather bag that will be handcrafted for you in Canada at our Toronto leather factory.

Let's talk about Roots!

Roots is a design driven company. The design team keeps the spirit and values of Roots in creating new products. Roots recognizes that effective variability requires deep understanding of people.


---

**Step One**
Reserve your appointment at one of our stores. Appointments are one hour each. Walk-ins are welcome.

**Step Two**
Choose your Award Jacket or bag and customize it with one of our expert leather makers.

**Step Three**
Your Award Jacket or bag will be handcrafted in Toronto, Canada at our leather factory.
Effective variability requires deep understanding of people
Roots founders sell majority stake in iconic Canadian retailer to Searchlight Capital

Roots founders Michael Budman and Don Green are selling a majority stake in the iconic clothing and leather goods company they founded, marking the end of an era.

Hellie Shaw
Oct 26, 2015 • October 27, 2015 • 4 minute read • Join the conversation

Clothing retailer Roots names Meghan Roach as new CEO

Published Tuesday, May 26, 2020 9:13AM EDT

The storefront of a Roots location in Toronto is pictured on Thursday, September 14, 2017. THE CANADIAN PRESS/Chris Young

SHARE: share Tweet Email Print

Right: https://www.ctvnews.ca/business/clothing-retailer-roots-names-meghan-roach-as-new-ceo-1.4954834
Diversity, Equality, Equity & Inclusion begins with acknowledging that disparities do exist. We acknowledge this reality and want to be a part of the solution.


Roots donates medical masks, $500K in products, repurposes its Canadian factory

Daily Hive Staff | Apr 29 2020, 7:07 am
Strategic thinking from Roots CEO Roach

“What we are doing is a series of things. We are trying to normalize, we are saying, ‘it’s okay not to be okay’, ‘it’s okay to balance the challenge in work and life’. We say, ‘Get your work done, not about how you get the work done’.”

<table>
<thead>
<tr>
<th>NEW ARRIVALS</th>
<th>WOMEN</th>
<th>MEN</th>
<th>KIDS</th>
<th>SWEATS</th>
<th>SHORTS</th>
<th>COLLECTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOTHING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Roots Salt &amp; Pepper™</td>
</tr>
<tr>
<td>Tops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>General Store</td>
</tr>
<tr>
<td>Bottoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BESTSELLERS</td>
</tr>
<tr>
<td>Sweats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GIFT CARDS</td>
</tr>
<tr>
<td>Dresses &amp; Jumpsuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphic T-Shirts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shorts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleepwear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jackets &amp; Outerwear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SALE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCESSORIES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarves &amp; Wraps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOOTWEAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHER BAGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WALLETs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHER ACCESSORIES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AWARD JACKETS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEATHER JACKETS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Any questions so far?
21st Century Design Approaches

1. What can we learn from chairs?
2. Breakthrough design of the 21st century
3. Design as a social movement
4. User-centered Design
5. Information Design
What can we learn from chairs?

Canadians are leaders in chair design.
Office Chairs
Teknion

Source: www.teknion.com/products/landing-pages/work-chairs
Lounge Chairs
Niemkamper

Source: www.azuremagazine.com/article/klaus-nienkamper-confessions-of-a-chair-man
"OH" Dining Chairs
Karim Rashid

Monobloc Stacking Chair
D.C. Simpson

Source: https://designwanted.com/design/monobloc-chair-white-plastic/
warehouse stock of monobloc chairs

Egyptian Throne
From 3500 BC

Source: https://www.designtoscano.com/product/king+tutankhamen+egyptian+throne+chair+wu70259.do
The idea of "chair" still holds power
What can we learn from chairs?

Chair design considers usage

- ergonomics
- durability
- weight
- folding ability
- stacking

**ISOs**
What can we learn from chairs?

Chair design considers *practical and aesthetic expressions of identity and brand!*
Wishbone Chair
Hans Wegner

Source: www.artsy.net/artwork/hans-jorgensen-wegner-model-ch24-wishbone-chairs-pair
Round Chair
Hans Wegner

"the most beautiful chair in the world!"

Source: https://www.mcmdaily.com/the-chairs-of-hans-wegner/
Lounge Chair
Ray & Charles Eames

"the natural evolution of furniture in a changing world."

Source: https://www.mcmdaily.com/the-chairs-of-hans-wegner/
Trends in Chair Design
Circular Economy Design
Circular Economy Design

Source: https://www.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail
Trends in Chair Design

Circular Economy Design

“Design is key to the first principle of circular economy, “design out waste and pollution…”

Ellen MacArthur
The idea of "chair" still holds power.

“Traditionally design has not considered product impact during its birth and use, and what happens when it is not in use anymore and thrown away. Products were not designed to last, allowing for new models to come fulfil the needs and temptations of consumers”

Katerina Medkova & Brett Fifield
The idea of "chair" still holds power.
Trends in Chair Design

Circular Economy Design

“[…] a range of designers working with recycled fabrics, garments, hardware and more, diverting post-consumer waste from the landfill and reinvigorating those lost materials with new life and value.”

Sass Brown
Circular Design includes...

Source: https://www.lifecycleinitiative.org/starting-life-cycle-thinking/what-is-life-cycle-thinking
Circular Design includes...

- Increased use of modular design
- Policy and tax incentives
- Material reuse for energy
- Additive manufacturing
- Building services around products
- Home delivery systems
- IoT platforms allowing for product tracking
- Creating markets for recycling
- Collaborative consumption
- Extending product lifespan
- Copyright and terms of use - NRC Publications Archive - Canada.ca
Trends in Chair Design

Circular Economy Design

As NRC scientists develop new materials, it is valuable to think of their life cycle.

Source: https://www.detail-online.com/article/new-materials-for-design-28261/
The retrofit of buildings for energy efficiency
The remaking of biomass into renewable power
The reuse of agri-waste for packaging materials
National Agreement on the Circular Economy

Letter of intent to develop transition agendas for the Circular Economy together

Back to our Chairs!
Broom Chair
Phillipe Starck

Chair design in our 21st century

Trends in chair design in the 21st century: Concept Design
- Circular Economy Design
- Systems Design
- Transformation Design
- Service Design
Trends in Chair Design

And now let's discuss the Generative Design chair!
Generative Design

Valuable when problems are too complex for humans to easily find solutions.
Generative Design

Valuable when problems are too complex for humans to easily find solutions.

Humans can work with computers to apply metaheuristics.

“a set of optimization techniques” based on “iteratively sampling solutions and using performance criteria to generate better and better outcomes”

Danil Nagy and Lorenzo Villagi
Generatively Designed Chair
Phillipe Starck

Code Chair
Karthik Patanjali

Source: http://www.karthikpatanjali.com/codechair
Data from pressure sensors on a time scale define this generative design.
The Smart Wheelchair
AI/Robotics Enabled

Source: https://ncdj.org/2019/01/toyotas-4-million-competition-to-re-invent-the-wheelchair/
The Smart Wheelchair
AI/Robotics Enabled

This is Inclusive Design

“The best SWs will be able to accommodate people with all disability types by utilizing a multi-modal interface that combines computer vision, touch, voice, and brain control. SWs will be able to build 3D maps using mobile scanners, and navigate autonomously by streaming and analyzing sensory data in real-time through cloud computing applications”

Jesse Leaman and Hung La
Please, stretch!
Any questions or comments?
21\textsuperscript{ST} CENTURY
DESIGN APPROACHES

Breakthrough design of the 21\textsuperscript{st} century
What is the most important design of the 21st Century?

The platform (Facebook, Netflix)
The electric car (Tesla)
The smartphone (iPhone)
What kind of mobile operating system do you use?

iOS
Android
BlackBerry OS
Windows
What do you mostly use your phone for?

Emails
News
Telephone/video chat
Text/Messaging
Social Media

Photo by Oleg Magni on Unsplash
How many hours do you spend on your phone?

0 to 1 hour
1 to 2 hours
2 to 3 hours
3 to 4 hours
4+ hours
Here is where you sit against a sample of the Canadian population
Mobile Operating System Market Share in Canada
(Stats Counter 2020-21)

- iOS: 51.49%
- Android: 48.08%
- Samsung: 0.32%
- BlackBerry OS: 0.05%
- Windows: 0.02%
- Unknown: 0.02%
- Other: 0.02%

MARKET SHARE PERCENTAGE (APR 2020 - APR 2021)
Most popular online activities via mobile device according to internet users in Canada as of March 2020

(Statistica)
Average Daily Mobile Online Usage in Canada from 2016 to 2020, by language

(Statistica)

Francophones  Anglophones

<table>
<thead>
<tr>
<th>Year</th>
<th>Francophones</th>
<th>Anglophones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1.21</td>
<td>1.68</td>
</tr>
<tr>
<td>2017</td>
<td>1.25</td>
<td>1.98</td>
</tr>
<tr>
<td>2018</td>
<td>1.56</td>
<td>2.57</td>
</tr>
<tr>
<td>2019</td>
<td>1.72</td>
<td>2.48</td>
</tr>
<tr>
<td>2020</td>
<td>2.23</td>
<td>2.82</td>
</tr>
</tbody>
</table>
Some other questions

What are your favorite features?

How many do you understand?

When, if ever, do you turn it off?

How do you respond when it vibrates or rings?
Your relationship with your phone may be one of the most complicated relationship of your life!
The iPhone
The 21st century game changer

Photo by Anna Shvets by on Pexels
The iPhone revolution

Source: https://commons.wikimedia.org/w/index.php?curid=95134172
“a widescreen iPod with touch controls”
“breakthrough Internet communication device”

Steve Jobs

Source: https://www.popularmechanics.com/technology/gadgets/a28984993/iphone-11-pro-camera/
Apple exemplified service design, which crosses virtual worlds and the tangible physical world to “create meaningful experiences for people.”
The iPhone revolution
Design is the fundamental feature in the shift away from products and towards services.

Photo by Boitumelo Phetla on Unsplash
Spotify sides with Epic Games in Apple app store battle over Fortnite

Last Updated: Aug. 14, 2020 at 1:22 p.m. ET
First Published: Aug. 14, 2020 at 1:00 p.m. ET

By Callum Keown

Referenced Symbols
SPOT 0.62%  AAPL 2.14%  GOOG 0.85%  4755 -3.64%
What would it take to build a better mobile phone?

A commitment to openness, a shared vision for the future, and concrete plans to make the vision a reality.

Welcome to the Open Handset Alliance™, a group of 84 technology and mobile companies who have come together to accelerate innovation in mobile and offer consumers a richer, less expensive, and better mobile experience. Together we have developed Android™, the first complete, open, and free mobile platform.

We are committed to commercially deploy handsets and services using the Android Platform.

Develop for Android
Get the SDK
Contribute to Android
Get the Source

Source: https://www.openhandsetalliance.com/
Led by Lee Kun-Hee, Samsung hired thousands of designers to become a design focused company.
*The world’s best-selling 5G smart phone*

Counterpoint Research, Sept. 2020
Usability is now merely the price of entry
National Research Council Canada

Canada's largest federal research and development organization

Most requested

Web clock

Drone site selection tool

Jobs available now

Order products

Codes Canada publications

Follow the NRC

Fighting back against COVID-19

COVID-19: Increasing biomanufacturing capacity

Support for clients and collaborators during COVID-19

Source: https://nrc.canada.ca/en/
The introduction of variability into universality allows consumers to feel control over products and their environment.

Strategic Foresight

Industrial Design

Service Design

User Experience Design
21ST CENTURY DESIGN APPROACHES

Design as a social movement
Design as a Social Movement – Towards Livable Cities

Design with the Other 90% is a current movement that refocuses designers on collaboratively solving challenges in the emerging world.
Source: https://www.archdaily.com/898409/4-principles-of-designing-with-indigenous-communities/photo
THE DEATH AND LIFE OF GREAT AMERICAN CITIES

JANE JACOBS

Source: Left: https://commons.wikimedia.org/w/index.php?curid=48369801
Right: http://www.edrants.com/the-great-urban-legacy-of-jane-jacobs/
Design Charette DPZ
Reinvent Phoenix, Axonometric Drawing

Source: https://www.dpz.com/projects/reinvent-phoenix/
Design as a Social Movement – Towards Livable Cities

The Reinvent Pheonix project focused on: Diverse Affordable Housing

Source: https://www.dezeen.com/2016/04/06/alejandro-aravena-elemental-social-housing-designs-architecture-open-source-pritzker/
Design as a Social Movement – Towards Livable Cities

The Reinvent Phoenix project focused on: Diverse Affordable Housing

Thriving Economic Development

Source: https://www.thoughtco.com/singapores-economic-development-1434566
Design as a Social Movement – Towards Livable Cities

The Reinvent Phoenix project focused on: Diverse Affordable Housing

Thriving Economic Development

Green Infrastructure

Source: https://www.nrdc.org/stories/green-infrastructure-how-manage-water-sustainable-way
Design as a Social Movement – Towards Livable Cities

The Reinvent Pheonix project focused on: Diverse Affordable Housing

Thriving Economic Development

Green Infrastructure

Balanced Land Use

Source: https://www.ibigroup.com/ibi-services/land-use-planning/
Design as a Social Movement – Towards Livable Cities

The Reinvent Phoenix project focused on: Diverse Affordable Housing

- Thriving Economic Development
- Green Infrastructure
- Balanced Land Use
- Connected Mobility

Source: https://medium.com/@shirarotem.abc/connected-mobility-and-the-city-d4b23321f1d5
Design as a Social Movement – Towards Livable Cities

The Reinvent Phoenix project focused on: Diverse Affordable Housing

Thriving Economic Development

Green Infrastructure

Balanced Land Use

Connected Mobility

Health and Vitality

Thoughts on how current NRC research is relevant to the complete communities design movement?
21st Century Design Approaches

User-Centric Design
Co-Design
Participatory Design

Photo by Anna Shvets from Pexels
Jakob Nielsen (left) and Donald A. Norman (right)

Source: https://www.nngroup.com/people-jakob-nielsen-photos/
Co-Design
Participatory Design
Working with users throughout the design process

Photo by Anna Shvets from Pexels
“Designers properly comprehend and specify the detail of user requirements and the context in which a product will be used before producing solutions”

Photo by UX Indonesia on Unsplash
Empathize

Photo by Lina Trochez on Unsplash
Contextual Inquiry

Source: https://uxdesign.cc/how-to-conduct-contextual-inquiry-sessions-tips-for-design-researchers-231a95111029
Design Probe

Source: https://probetools.net/probes
Observation

Photo by Max Letek on Unsplash
Map

Left: https://probetools.net/probes
Right: Photo by Omar Flores on Unsplash
Define
Problem Statement
Ideate
Constraints
Design Concept
User Journey Map

Photo by UX Indonesia on Unsplash
Prototype
Usability Test

Source: https://www.userfeel.com/blog/what-is-usability-testing
How might Canadian Governance be transformed in the digital era?

Source: https://slab.ocadu.ca/project/synthesis-maps-gigamaps
Left: https://www.yankodesign.com/2012/07/25/anywhere-mouse/
Right: https://www.coffeeshopexpo.co.uk/news/blog.asp?blog_id=5369
21ST CENTURY DESIGN APPROACHES

Information Design – 21st Century focus on data
Information Design – 21st Century focus on Data

Data does not become information without interpretation which requires skillful interpretation.

Data visualization is essential for the analysis of data produced through experimental research, and for the communication of science and the process of science.

We offer examples of data visualization projects relevant to Canada's energy sector.
INCIDENTS AT CER-REGULATED PIPELINES AND FACILITIES

The information presented here is based on CER data from 2008 to current for incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations. New data is added quarterly. The last update was 2021-03-31. Learn more on how data collection has evolved since the NEB (now the CER) was established in 1959.

“I look at projects of digital transformation and the way people absorb information. We live in a world with more and more data. More data, however, does not necessarily mean more insights or clarity.”

Annette Hester
Data Visualization Initiative

FINAL REPORT
JUNE 2020

Data visualization is now integrated into all CER reporting, for example Incidents at CER regulated pipelines.

Source: https://apps2.cer-rec.gc.ca/pipeline-incidents/
“The next frontier is for data visualization to become ubiquitous for gaining insights and exacerbating scientific discovery.”

Annette Hester
How have you used data visualization in your work? What opportunities do you see?
SUMMARY

1. What can we learn from chairs?
2. Breakthrough design of the 21st century
3. Design as a social movement – the quest for livable cities
4. Information Design – 21st century focus on data
21st Century Design

Design has expanded to include many strategies of addressing needs and imagining solutions.
Economic Impact of Design Adoption

Design operates as an important source of economic value.

Countries with a high innovation and competitiveness ranking invest heavily in design.

Studies have shown that firms that invest in design outperform others.

Design will be an important factor to plan out of COVID-19.
Thank you!
Any final questions?
Design for Our Times

Next workshop: Design Thinking, an Overview

June 2nd, 12:30 - 2:00 p.m.
APPENDIX
Glossary

**Body Storming**
A method where one imagines what it would be like if a product existed by acting as though it exists.

**Concept Design**
An early-stage design process where the outlines of function and form are articulated through concept sketches and models.

**Contextual Inquiry**
A research method which involves observation and interviews of a small sample of users to gain understanding of practices and behaviours.

**Design Probe**
A documentation method where users observe, reflect upon, and document their everyday lives and experiences.

**Design Prototype**
A simulation or sample version of a product created for testing before time and money is invested into development.

**Experience Design**
The practice of designing with a focus placed on the quality of the user experience and the cultural relevance of the solution.
**Functional Design**
A design method focused on making products that respond to the needs of the user and that work well to perform their assigned tasks.

**Ideation**
A stage of Design Thinking where a large quantity of ideas and solutions are generated.

**Journey Mapping**
The process of visualizing a user’s relationships with a product over time through different lenses.

**Mapping**
The visualization of information.

**Observation**
A design method consisting of observing and recording user performing tasks.

**Personas**
Fictional characters stemming from research created to represent the types of user that might use a product.
Glossary

Problem Statement
A statement identifying the gap between the current and desired state, and framing it in an actionable way.

Prototyping
A stage of Design Thinking where simple experimental models of proposed solutions are created in order to test or validate ideas.

Scenario Making
The description of an envisioned concept, idea, or way a user uses a product.

Sustainable/Circular Design
The design of products and services that no longer have a lifecycle which will result in the creation of less to no waste.

Transformation Design
A design process that seeks to create desirable and sustainable change for individuals, systems, and organizations.

Usability Testing
The evaluating of a product by testing it with its potential users.
Glossary

**User centered design**
An iterative design process focused on putting the users and their needs at the center of product design and development.