DGIN 5201
Digital Transformation
Lecture 1

Course Introduction

Vlado Keselj and
FE. Bordeleau

Time and date:
13:05–14:25, 7-Jan-2025
Location: LSC C236

Image: DALL-E. Bing Image Creator. Generated by AI

Course Information

- Course: DGIN 5201 Digital Transformation
- Lectures: Tue/Thu 1:05pm–2:25pm,
  LSC-Common Area C246
- Instructors: Dr. Vlado Keselj and Dr. FE. Bordeleau
- Labs: B01 Fri 11:25–12:25 Goldberg CS 134
  B02 Fri 13:05–14:25 Goldberg CS 143
- TAs: *TBA*
- Web: `https://tr.cs.dal.ca/dgin5201`
- Brightspace: `https://dal.brightspace.com/d2l/home/360488`

Digital Transformation – One View

- Digital Transformation:
    - innovation based on digital technologies, and
    - adoption of digital technologies

  to fundamentally improve an organization's processes

- This is a **key skill**:
    - Businesses disrupt business models with digital tech
    - Health systems radically improve process efficiency
    - Data-driven decisions are adopted to improve decision making

  This intensive course incorporates both hands-on and theory to help prepare you for the workforce.

Why do we have two profs?

- Digital Transformation course is the core, or "heart" of the MDI program

- Includes essential synergy of two academic traditions: Computer Science and Business

- The course it taught by two professors from the two traditions, each following principles and approaches typical in their areas

- This term the course instructors are:

Dr. Vlado Keselj Computer Science	and	Dr. FE. Bordeleau Management

Learning Outcomes

- Overall learning objective:
  Combined learning of business and technical approaches to
  Digital Transformation and Digital Innovation

- Learning outcomes:

1. Digital disruption   **2. User experience**   **3. Front end tech**

4. Data & backend   **5. Entrepreneurship**   **6. Prototyping**   **7. Emerging tech**

Delivery

- This is an in-person class. The course works better in-person.

- Networking is important. Working in a "random" team is a learning objective.

- Labs may not be used each week, always available for team work

- Content is on Brightspace and Course Web Site

- We will use: Email, Teams, Gitlab as well

- Best effort will be put to have lectures recorded, but no guarantees!

List of Topics

- Course introduction (Lec 1, w1)

- Rapid Prototyping (Lec 2–6, w1–3)

- Disruptive Innovation and Business Strategy (Lec 7–12, w4–6)

- Emerging Technologies and Prototyping (Lec 13–24, w7–12)

  - ▸ 4 Emerging Technologies (2 business and 2 CS)
  - ▸ Team Project Work and check-ins

Evaluation

- 30% — Individual Assignments (A1 + A2)

- 20% — Seminar Reports ($4 \times 5\%$)

  - on Emerging Technologies, Individual

- 50% — Final project, Group Work

  - project spec. + early prototype + demo + report & code + peer ev.
  - 5% + 5% + 10% + 25% + 5%

Academic Integrity Policy

- Please read the given handout (also available at the course web site)

- Suspected cases of plagiarism are referred to Academic Integrity Officers, and may lead to serious consequences

- Plagiarism is defined as "the presentation of the work of another author in such a way as to give one's reader reason to think it to be one's own"

- Fully reference sources in your assignments and reports

- Write in your own words

- You can look at other code, but do not cut-and-paste!

- Discussing assignments verbally is likely not an issue, but do not discuss it in writing or typing

Dalhousie Culture of Respect

- We believe that inclusiveness is fundamental to education and learning.

- Every person has a right to be respected and safe.

- Misogyny and disrespectful behaviour on campus, wider community, and social media is not acceptable. We stand for equality and hold ourselves to a higher standard.

- Take an active role:
  - Be ready: do not remain silent
  - Identify the behaviour, avoid labeling or name-calling
  - Appeal to principles, particularly with friends, co-workers or similar
  - Set limits
  - Find an ally and be an ally, lead by example
  - Be vigilant

Business and CS Part

- We can now discuss in more details two approaches:
    1. Business Approach
    2. Computer Science Approach

Overview of Technical Part

- Implementing a solution: Rapid prototyping
- Review of programming and Web fundamentals
- Hands-on exercises in fundamental technology
- Elements of building a three-tier system
- Techniques for rapid prototype building
- Applied in the course project

About CS Instructor

- Dr. Vlado Keselj (pron.: Vlado Ke-sh-el)
- E: vlado@cs.dal.ca
- W: vlado.ca
- Director of the MDI program
- Professor in Computer Science
- BCS, Master's, and PhD in CS
- Research: NLP, ML, AI, Data Mining, Innovation

Digital Transformation

- One business-oriented defintion:
  "**Digital Transformation:** The *adoption* of digital technologies that fundamentally improve an organization's processes."

- **Digital Innovation:**
  - ▸ Sometimes defined as identical to Digital Transformation; or
  - ▸ A continuous activity of finding opportunities for leveraging digital technology

- For **successful** Digital Transformation:
  - ▸ We need to understand the problem (need, "pain"), and
  - ▸ We need to understand the technology that we can use

Digital Transformation: Good, Bad, and Ugly

- DT: "The Good, the Bad, and the Ugly"
  - a handy expression from the 1966 Sergio Leone's movie

- Good: efficiency, flexiblity
  - easier communication, collaboration
  - Goal: increase it

- Bad: risks of data, money, and time loss
  - data breaches, cyber scam
  - Goal: eliminate it

- Ugly: not actually efficient
  - increased complexity and loss of time and effort
  - Goal: decrease it

Digital Transformation: the "Ugly" side

- A quote by John Ralston Saul:

  "The effect of new technology has been to draw even senior managers into minutiae. People paid to think and lead now spend much of their time typing and responding to or sending an endless stream of unnecessary messages, simply because communications technology invades every second and every corner of their lives. This bureaucratization of both the leadership and the creative process makes thought seem irresponsible and clear action seem unprofessional. It provides a sensation of activity while creating a broader sense of powerlessness. This is what used to be called **being nibbled to death by ducks.**"

Fundamentals of Digital Innovation

- A historical look at digital innovation
- Computer Science elements of digital innovation

Three References in Digital Innovation
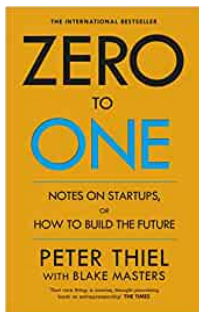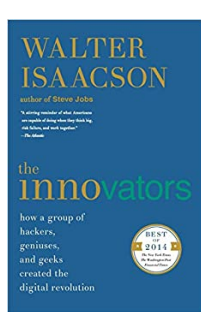
- Walter Isaacson: The Innovators
- Peter Thiel with Blake Masters: Zero to One
- Yevgeniy Brikman: hello, startup

Three References in Digital Innovation

- Walter Isaacson: The Innovators
  - How a group of hackers, geniuses, and geeks created the digital revolution
- Peter Thiel with Blake Masters: Zero to One
  - Notes on startups, or how to build the future
- Yevgeniy Brikman: hello, startup
  - A programmer's guide to building products, technologies, and teams

Rapid Prototyping / Implementing a Solution

- Tentative plan:
- Tuesday class used to cover concepts and theory
- Thursday class to go over hands-on exercises
- Exercises aimed at `timberlea` server
- Use your CSID and password
- Use of web site:
  https://web.cs.dal.ca/~*YourCSID*

Some Items to Check Early

- Check your CSID and password, helpful site:
  https://csid.cs.dal.ca/
- Helpful if you have experience in ssh login to
  timberlea.cs.dal.ca
- Mac or Linux: ssh can be used from terminal
- Windows: PuTTY can be used
- PuTTY can be installed from
  https://www.putty.org/

Some Key Moments in Digital Revolution

- Ada Lovelace, Charles Babbage, around 1843
- Building a Computer, 1937–1945
- Discovery of Transistor, 1947
- Microprocessor (Intel 4004), 1971
- The Internet, 1973
- The Personal Computer (Altair 8800), 1974
- The Web and Online access, 1991