Introduction to Technology Battles

I&E Basics/IBICT 2019

7th October 2019
What is a battle?
What is a battle?

In essence, it is made of two elements:

- Analysis of “real life” examples (aka Case study)
  - Competing innovations
  - Competing entrepreneurs
  - Ethical dilemmas
  - Scientific debates
  - ...
- Through enacted dialectics (aka British Parliament model)
Case Studies
Case Studies

- Widespread methodology for education in business
- Used in MIT, Stanford, Harvard, Oxford, Cambridge...
- They combine
  - Induction (learning from examples)
  - Deduction (learning from theory)
Induction
Induction

— Learning from examples, creating generalizations
— In mathematics
  - Applied to natural numbers, it allows to prove that:
    – If a certain property is valid for the first number - a “base case” $n = 0$ or $n = 1$
    – And assuming that it is valid for $n$, the same property holds for $n+1$
    – Then it is valid for all natural numbers
— ...more concretely in our real life
  - Allows us to say that if something has always been a certain way, it will likely stay that way unless something external happens
    – I have seen the Sun rising every day, and always from the East
    – I have seen hundreds of swans in my life, and they're all white
    – I am alive today, so I'll be alive tomorrow...? (this might be problematic)
Induction fallacies

– Hasty induction leads to mistakes
– Take the statement from before:
  - I am alive today, so I’ll be alive tomorrow
– The induction does not go on indefinitely, and we cannot know when it stops
– So we need to be conscientious about using induction
– We can combine induction with deduction
Deduction
Learning from theory, verifying (or better, falsifying — see Popper) it in the world

In philosophy, syllogisms:
- If Socrates is a man
- and if all men are mortal (notice this is induction!)
- it logically follows that Socrates is mortal

In science, theoretical physics, or cosmology

Main problem: might take years, centuries, millennia to falsify a deduction...
British Parliament
Why the British Parliament?
British Parliament

— Soft skills are part of the debate (and thus the class)
  - Leadership
  - Presentation
  - Public speaking
  - Negotiation
  - ...

— Also, these elements
  - Facts and fact-checking
  - Non-factual argumentation aka “b.s.”
  - Self-arbitration
  - Oversight from a neutral 3rd party
Why use battles to teach I&E?
Innovation
Innovation

— The debate structure shows how innovation is not “hard facts”, but the composition of many “soft” factors
— Learning is done through exploration rather than exploitation (see bibliography)
— If innovation is about being “out of the box” → We have to teach in out of the box ways
Entrepreneurship
Entrepreneurship

— The soft skills required to debate are the same that compose an entrepreneur’s toolkit...
— But more than this, even just the organization of the battles requires you to be entrepreneurial
Open and closed debates
Open and closed debates

— Through battles, we analyze both “closed” debates (i.e., cases in which we already know who won) and “open” debates (i.e., matters that the society has not yet settled upon)

— Example of “closed” debates:
  - Is the Earth at the centre of the Universe?
  - Which is the superior plane between Boeing 747 and Concorde?

— Example of “open” debates:
  - Is copyright a good thing or a bad thing?
  - Does mass immigration help a country’s economy?
Example: Star Wars

- We take the famous movie Star Wars
- We show how one storyline can be seen as an open or a closed debate
- This also has an impact on our reasoning
- How we perceive the debate changes how free we are to draw conclusions
Star Wars: Constructing a prequel

I  II  III  IV  V  VI
Retrospective reasoning

- This is how the Star Wars movies were filmed
- Ep. 4 starts “in medias res”, and does not resolve the main storyline
- By Ep. 6, the story is closed
- By setting the grounds in Ep. 1, the stories of Ep. 2 and 3 are “forced”
- This allows us to maintain internal coherence to the universe (i.e., Ep. 4-6)
- This is an example of retrospective reasoning, which is based on justification of previous actions
Star Wars: Constructing a sequel

I | II | III | IV | V | VI
Prospective reasoning

- This is an alternative way to see the Star Wars universe
- Assume Lucas filmed Ep. 4, then went back to make the original trilogy
- How do Ep. 5 and 6 go?
- This is hard to reasonably guess, and represents an unexplored realm of possibility
- This exemplifies prospective reasoning, based on speculation, hypotheticals and a combination of induction and deduction
Retrospective vs prospective

- Each type of reasoning naturally work better with open or closed debates
- To go deeper in the concept, we will compare them directly
Retrospective vs prospective

given the current state of the world, how did we get here?

GIVEN AN ALTERNATE BEGINNING, HOW COULD IT END?

Retrospective case studies

Prospective case studies
Retrospective reasoning

State of the world $\rightarrow$ Analysis $\rightarrow$ Explanation

Goal: Retrospectively find answers
Prospective reasoning

Alternative beginning ➞ Controversy ➞ Reconciliation

Goal: Create questions; affect final result
The class framework

— We have seen the two “modes” in which we can conduct case studies, but how do these interact with the British Parliament model?
— Most of all, this requires to change the core framework of the class...
Conflict and Competition
Who wins a battle?
And the winner is...

- We are in the British Parliament, which allows direct confrontation
- The winner is found during the debate, not several years after
- We don’t have the luxury of retrospective and hindsight
- Therefore, your goal is to be convincing, grounded, visionary
- The winner is the most plausible, not the most right
Content
Battle content

- Each battle has three main levels
- Horizontal content
  - Social/Economic context
  - Broader perspective
- Vertical content
  - Domain-specific content of the class
- Scenario (only for I&E Basics)
  - Usually a science fiction/fantasy story
  - Allows to abstract from the real world and explore more freely
Horizontal Content
Horizontal Content

— We call “horizontal” content those elements in the battle discussion that could be applied to any battle
— Examples of these are societal impacts, reflections on economic viability, ethical concerns...
— These go across battles, and allow to provide a coherent “context” throughout the course
Vertical Content
Vertical Content

— We call “vertical” content those elements specific to the debate in a battle
— Examples of these are comparisons of space tech in a battle on the 1960s/1970s “space race”, or of magnetic tapes in VHS vs Betamax
— These are isolated to one battle, and give the “core matter of fact” of each debate
Scenario

(mostly relevant to I&E Basics...)}
Scenarios allow to abstract from history/state of the matter to have a broader vision of a topic.

- Scenarios are *counterfactual*, and based on a “what if..?” question.
- This allows to reopen closed debates.
- An example of this is the rewriting of history (What if barbarians didn’t invade Rome?) or alternate presents (What if tomorrow we were to get in contact with another civilization?)
Battle themes
Battle topics

- Steve Jobs vs Bill Gates
- Uber vs Taxis
- Realpolitik vs Ideology
- Tesla vs Edison
- Robots vs Cyborgs
- Reforming the EU’s Copyright Law
- ...
“Dissecting” a battle

— Taking one of the above scenarios, here is how it is decomposed in the three elements

— Wikileaks good vs bad:
  - Scenario: A secret document is found that would invalidate the election of Angela Merkel in the 2018 elections. Should Wikileaks publish it, at the cost of jeopardizing the equilibrium of Europe?
  - Horizontal content: Social impact of politics
  - Vertical content: Security vs privacy debate; discussions about Wikileaks as a platform
Class flow
Battles as Blended Learning

— Battles are a Blended Learning methodology
— Each battle is done across three main moments:
  - Pre-class
    – Done by students and teachers before the battle itself
  - In-class
    – Actual run of the battle
  - Post-class
    – Follow-up to the class activity
— We will analyze each of them in the next slides...
Pre-Class
Pre-Class

“Battle preparation”
- Involves the two battle teams, the critical minds and the teachers
- Each battle is introduced two weeks in advance
- The meeting lasts ~1hr
- Typical time: last part of the class (Mon ~5PM)
- Teachers present the scenario and take questions
- Students negotiate the “battleground” i.e., what is in and out of scope for discussion
- Students prepare the battle autonomously
In-Class
In-Class - Anatomy of a Battle

- 10’ per team → Opening statement
- 40’ → Rebuttals, cross-examination, audience interventions
- 10’ break
- 40’ → More cross-examination
- 5’ per team → Closing statement
Post-Class
Post-Class

— “Battle Report”
  - “Word-like” document, around 10/12 pages
  - Written jointly by the two opposing teams
  - Summarizes scenario and theory background
  - Explains each team’s point of view
  - Finally, provides a reconciliation/conclusion
  - Reconciliation is a synthesis → More than the sum of two parts!
  - Template published around Nov 1st
In short

– Battles are **case studies** based on **debates**
– Debates can be **retrospective** or **prospective**
– Focus is on **plausibility** over facts-of-the-matter
– Content is both **horizontal** and **vertical**
– Wrapping and abstraction is done through **scenarios**
What next?

- Wednesday, Oct 7th from 14:30 to 16:30 in A205
- Topics:
  - Skills for Innovation
Bibliography

— On open and closed debates: Latour; Science in Action; Harvard University Press 1987; Chapter 1
— On exploration: March; Exploration and Exploitation in Organizational Learning; Organization Science, Vol. 2, No. 1 (1991); https://doi.org/10.1287/orsc.2.1.71
Questions?

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