



LEARNING AS A MACHINE

CROSS-OVERS BETWEEN HUMANS AND MACHINES

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- due to potential copyright infringements all the cartoons have been removed from this presentation
- since it was a cartoon-driven presentation you may find little text on most of the slides
- please connect with the author at m.hildebrandt@cs.ru.nl for the full text of the keynote, including some footnotes

Kahoot: making learning awesome?

Here is a student posting on Twitter as @beansalaad:

“I finished 5th in the @GetKahoot quiz ‘How does the Constitution protect freedom of expression’ out of 22 players, with 4,754 points!”

Natasha Singer, *The New York Times*, April 16, 2016

“Student testing is like using a thermometer to try to diagnose what kind of cancer an individual has,” Mr. Simmons said.

By KATE TAYLOR, *The New York Times*, April 23, 2016

Shall we come to depend on learning analytics (LA)?

two levels of intervention

1. First Level LA:

- interventions at the level of an **identifiable student**,
 - both when **collecting** her data, and
 - when **applying the results of LA** to her.
- **Whether or not she is aware of this.**
- Note that identifiability includes **indirect** identification and
- identification includes **‘being singled out’**.

two levels of intervention

2. Second level LA:

- is *not about interaction with identifiable students*, but
- concerns the **analyses of the data** that prepare potential interventions with regard to the student.
- This data can be **anonymous or personal data**
- If personal data it can be either *pseudonymous or not*
 - *anonymisation would rule out the applicability of data protection law,*
 - *pseudonymisation does not,*
 - *but it may qualify as proper protection of the data.*

two levels of intervention

2. Second level LA:

pseudonymous data is defined as:

- ‘the processing of personal data in such a way that the data *can no longer be attributed to a specific data subject without the use of additional information*, as long as such additional information is kept separately and subject to technical and organisation measures to ensure non-attribution to an identified or identifiable person’

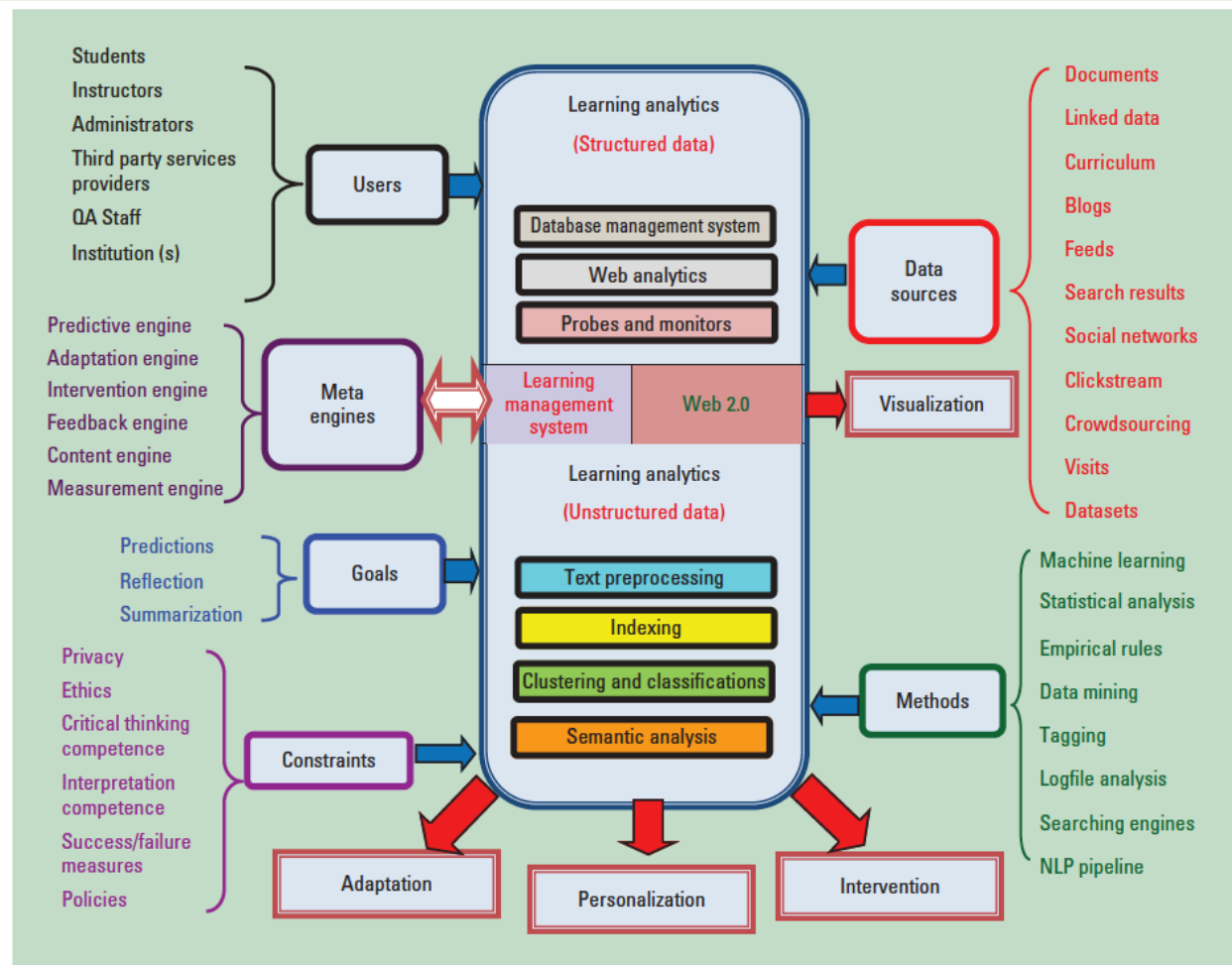


Figure 1. A comprehensive learning analytics architecture.

Jinan Fiaidhi, The Next Step for Learning Analytics, IT Pro Sept/Oct 2014 IEEE

affordances of learning environments

learning capabilities of humans

1. what ML **does**

- *when employed to contribute to HL*

2. how ML may **transform** HL

- *since learners need to anticipate how ML frame their learning behaviours*

Pavlov approach

Pavlov approach: manipulating behaviour

Simon approach

Simon approach: optimal optimization

Gibson approach

Gibson approach: the ecological niche

first level issues

Privacy

Non Discrimination

Due Process and Presumption of Innocence

Second level issues

LA creates a novel set of affordances

**an affordance refers to the
actionability of the environment**

Old School learning affords reflection

legal protection by design

General Data Protection Directive (GDPR)

1. will create a level playing field
2. will require a data protection impact assessment
3. will privilege the processing of pseudonymous data

GDPR & profile transparency

- **'profiling' means** any form of automated processing of personal data consisting of the use of personal data to *evaluate certain personal aspects* relating to a natural person, in particular *to analyse or predict* aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements;

GDPR & profile transparency

1. *the **existence** of automated decision-making*, including profiling, referred to in Article 22(1) and (4) and, at least in those cases,
2. ***meaningful information** about the logic* involved,
3. as well as the *significance and the **envisaged consequences*** of such processing for the data subject.

GDPR & profile transparency

Art. 22 (1) and (4) read:

The data subject shall have *the right not to be subject to a decision based solely on automated processing*, including profiling, which produces *legal effects* concerning him or her or similarly *significantly affects* him or her.

Decisions referred to in paragraph 2 shall not be based on special categories of personal data referred to in Article 9(1), unless point (a) or (g) of Article 9(2) apply and suitable measures to safeguard the data subject's rights and freedoms and legitimate interests are in place.

L.A. liberty and dignity

- Learners need the right to object to being targeted as a specific type of learner, if based predominantly on invisible statistical inferences
- Learners need profile transparency to anticipate how they are anticipated
- Learners deserve equal respect and concern as a person, before being seen as data engines

DataBait

- <http://www.usemp-project.eu>
- Providing users of Online Social Networks a fair idea of the types of profiles that may be inferred from their datapoints – based on mining their aggregated data (voluntary & behavioural; OSN & browser).

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