



Athabasca University 

SCHOOL OF COMPUTING & INFORMATION SYSTEMS  
CENTRE FOR LEARNING DESIGN AND DEVELOPMENT

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# **AAT – A Tool for Accessing and Analysing Students' Behaviour Data in Learning Systems**

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# Motivation

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- Learning systems usually track a lot of data every day
- Those data can
  - provide us with valuable information about what students are actually doing in our courses
  - help understanding students' engagement and performance
  - help understanding which learning objects/materials/resources support students (and which do not)
  - ...

# Moodle Analytics Project

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- Aim of the Moodle Analytics Project at Athabasca University is to develop a tool that helps to better understand the effectiveness of the learning environment
- Draw conclusions about learners' success and find indicators for success / drop-out / poor marks

Possible indicators can be

- Frequency of logins
  - Time a student spent in a learning system per week
  - Whether a student visited certain learning objects
  - Time spent on certain learning objects
- Draw conclusions about learning material
    - What (types of) learning objects are useful in a course?
    - Are there learning objects where students used to spend much more time than on other LOs?

# Objectives and Design Decisions for the Academic Analytics Tool

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- Aim is to allow users (e.g., learning designers, teachers) to
  - extract detailed information about how students interact with and learn from online course in a learning system,
  - to analyse the extracted data, and
  - to store the results
- Allow users to decide and specify what data they are interested in (rather than choosing only from pre-defined information)
- Designed for analytics in educational institutions and therefore aims at flexibility with respect to the choice of course (rather than focussing only on one single course)
- Applicable for different learning systems and different versions of learning systems (not only one particular learning system)

# Architecture of the Tool

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## ■ Four design elements

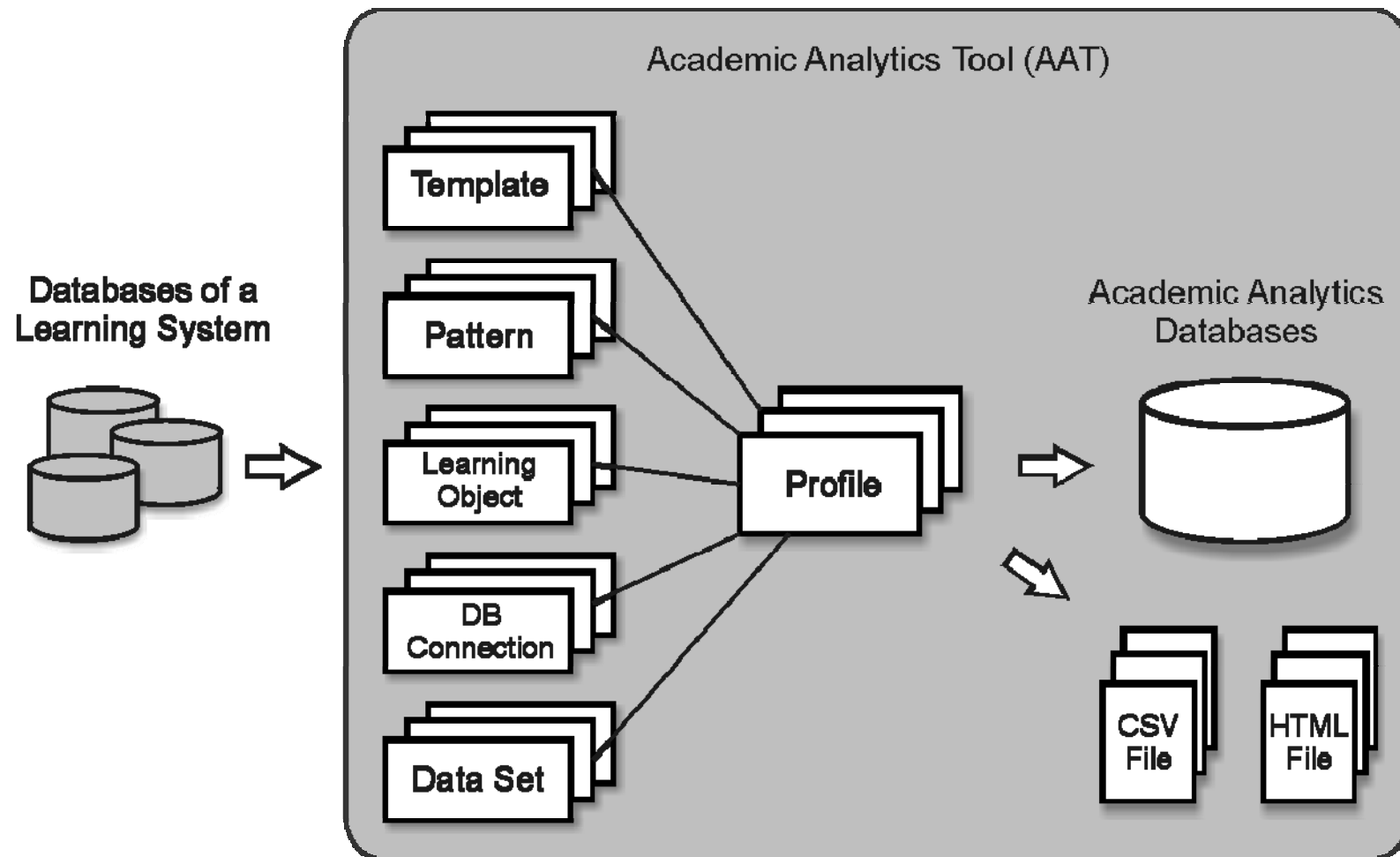
- Framework of learning objects
  - Courses consist of learning objects (e.g., learning material, quizzes, forums, etc.)
- Patterns
  - Based on types of learning objects
  - Specify what data the user is interested in (and what data should be extracted)
  - Can be a query or a formula supported by a query

# Architecture of the Tool

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- Templates
  - make the tool applicable for different learning systems
  - specify where the data resides within the database of the learning system (i.e., what tables and columns)
  - templates can be created for different learning systems and different versions of learning systems and then used for extracting data from the respective (version of) learning system
- Profiles
  - Experiment for extracting and analysing particular information
  - User specifies:
    - Which learning system is used (through templates)
    - How to connect to the data (through selecting and setting up database connections)
    - Which courses/learning objects should be investigated (through selecting the data set)
    - Which patterns should be investigated
  - Once the profile is created, it can be used for extracting data

# Architecture of the Tool



# Functionality of AAT

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Demo ...



# Conclusions and Future Work

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- AAT allows users to perform simple and complex analytical queries on students' behaviour in online courses
- Currently, the tool is under evaluation by our learning designers (with respect to usability and usefulness)
- Benefits of this tool and our plans for using it include:
  - Evaluate courses at AU, and based on the results, improve/extend the learning materials/resources which have less value for students and encouraging the development of learning materials/resources which generate successful learning
  - Identify factors affecting students' success
  - Create automatic interventions to enhance student retention, motivation and/or learning; as well as sharing information about students' progress with tutors and students
- Future work: Release the tool as open source product