A Model of Adaptive Learning with Interactive Images - ADELE

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Outline

- **Introduction**
- Concept Model of ADELE
- ADELE Architecture Model
- Discussion
- Conclusion & Future Work

Introduction

- ## Interactive images technologies
  - ### Mapping technologies
    - Google Maps Engine

- ## Motivation
  - ### Analysis of medical images
  - ### Adaptive e-Learning environment
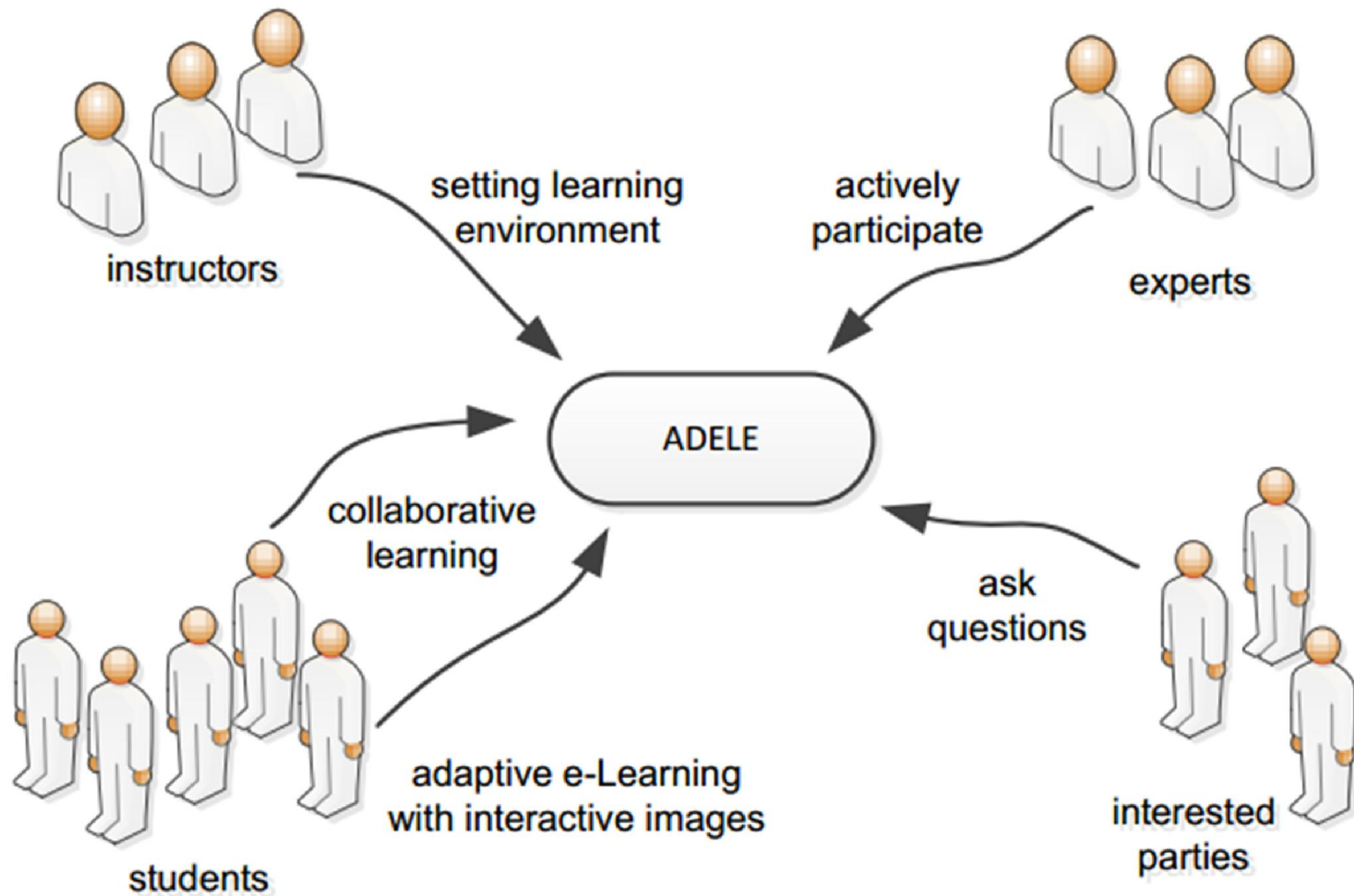   - ADELE (ADaptive E-Learning)

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Concept Model of ADELE

Intelligent software agent that takes the role of a professor in the learning process

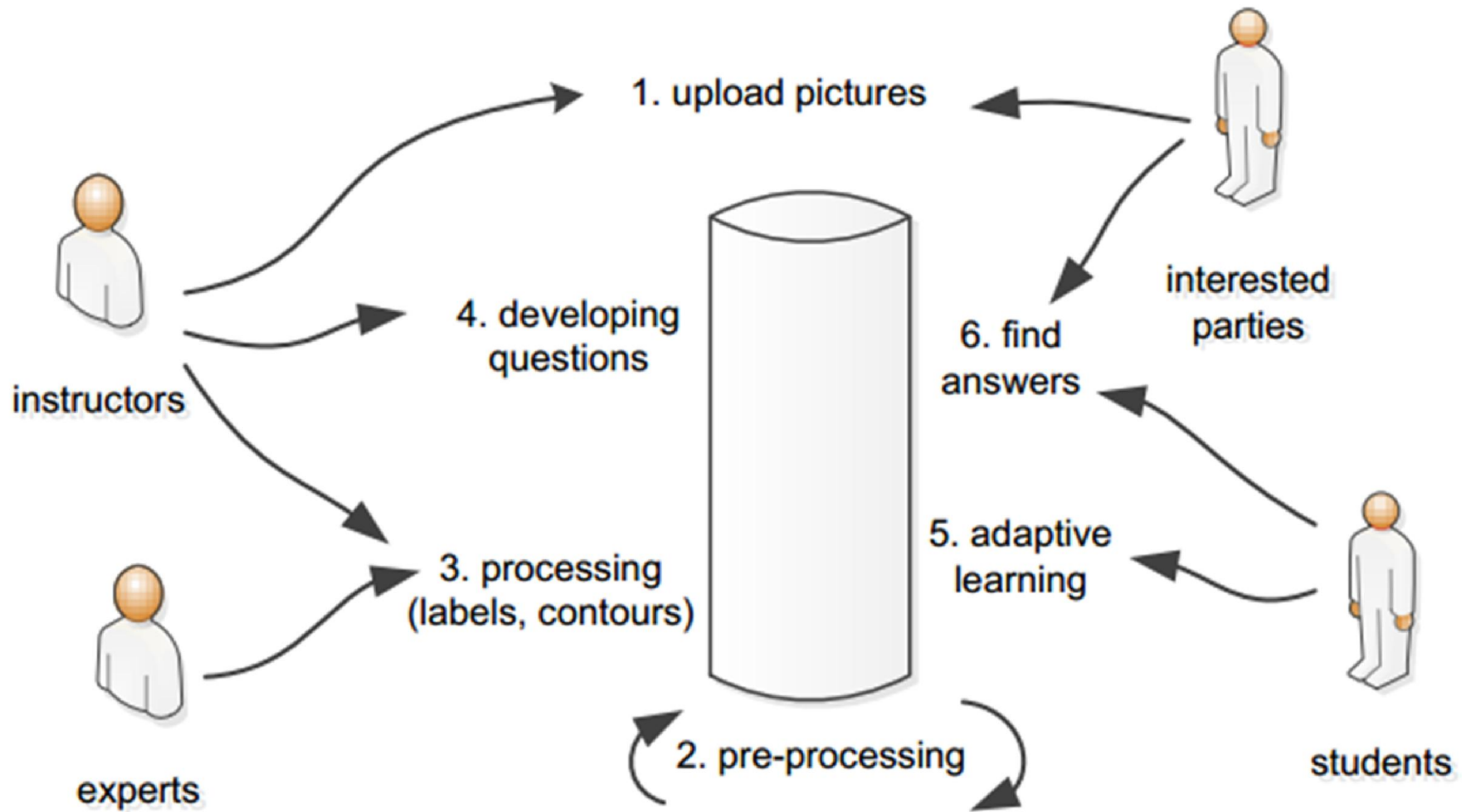# ADELE Actors

ADELE Actors

- Instructors
  - Setting the e-Learning
  - Learning Management Systems (LMSs)
- Students
  - Learning functionalities
  - Learning materials (Static, Interactive Images)
  - Answers placed on pictures

ADELE actors

- External experts
  - Participate on a commercial basis by giving opinions
  - Contribute in the e-Learning system
- Interested parties
  - Analyze the latest research results
  - Life long learning process

ADELE Interactions

1. upload pictures

4. developing questions

instructors

3. processing (labels, contours)

experts

2. pre-processing

6. find answers

interested parties

5. adaptive learning

students

ADELE Interactions

1. Upload pictures
   - Instructors and interested parties
2. Pre-processing (preparing the pictures)
   - Automated system
3. Processing (setting the questions)
   - Instructors
4. Adaptive learning
   - Students
5. Find answers
   - Interested parties and students

ADELE functional description

- Fast communication and response times
- Pointing and panning on interactive learning environment
- Picture navigation
- Pointing and drawing lines
- Object labeling
- Multimedia interaction
- Picture processing (blurring, fading etc.)

ADELE HCI

- Traditional interaction
  - Mouse, keyboard or touch pads
  - Touch functionalities are incorporated
    - Multi-touch technology
- Portability
  - Full outdoor access 24 hours a day
    - Small devices equipped with Internet access
- Response
  - Textual and/or graphical objects

ADELE Question Types

- Single Graphic Choice (SGC)

- Opinion Map (OM)

- Multiple Graphic Choice (MGC)

- Voting Question (VQ)

- Matching Question (MQ)

ADELE Question Types

- ## Single Graphic Choice (SGC)
  - Graphical variant of classical multiple choice question with a single answer but with enormous of possibilities to include answer options
- ## Opinion Map (OM)
  - Collect opinions about certain objects in the image
  - Ideal for collaborative learning
  - Users pin and write comments on graphical objects

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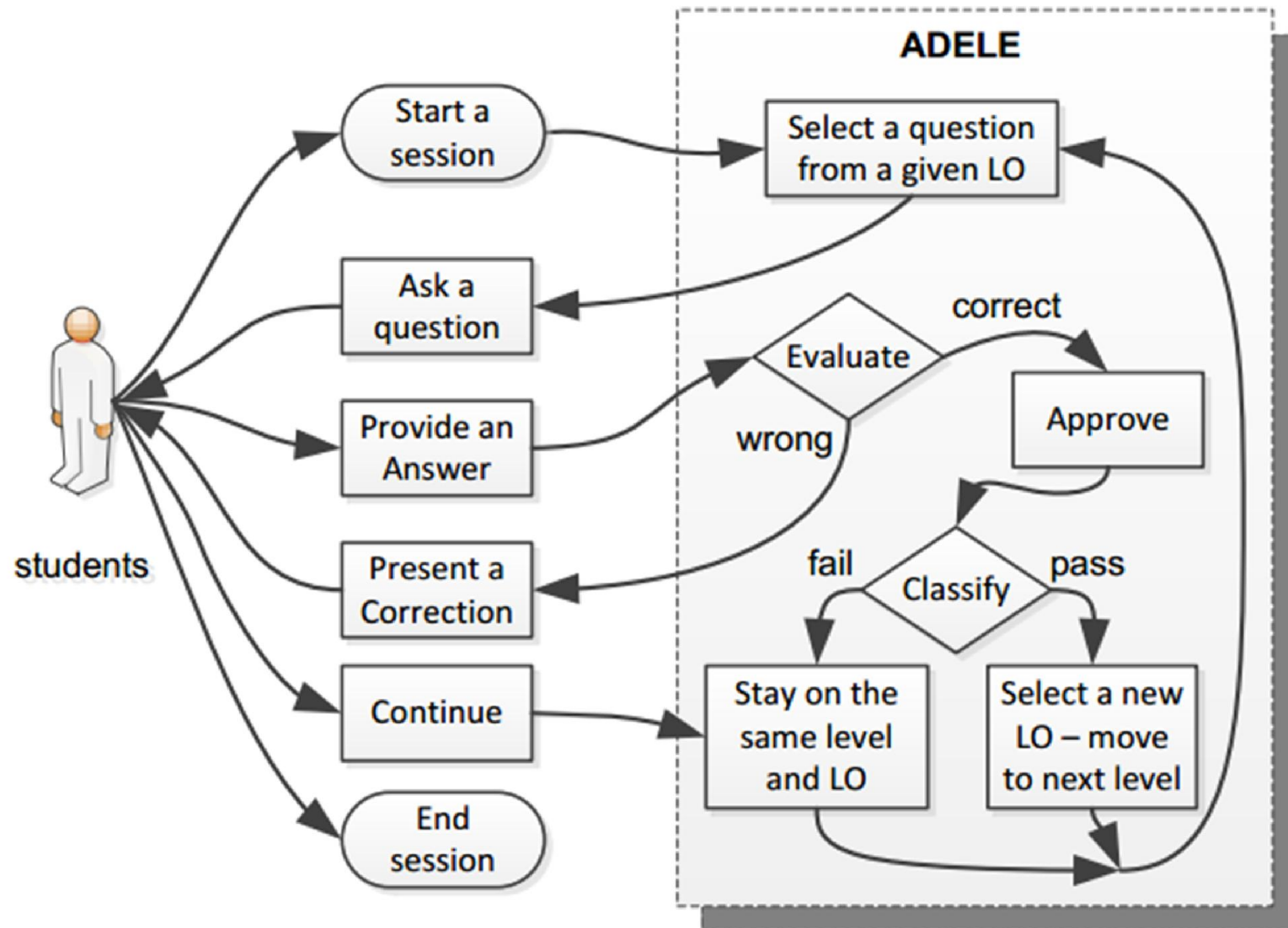PROMOTIONAL PARTNERSHIP

ADELE Question Types

- ## Multiple Graphic Choice (MGC)
  - Similar to SGC
  - Selecting multiple answers on the image

- ## Voting Question (VQ)
  - Graphical variant of textual voting

- ## Matching Question (MQ)
  - Matching among different graphical objects by drawing a line among these objects
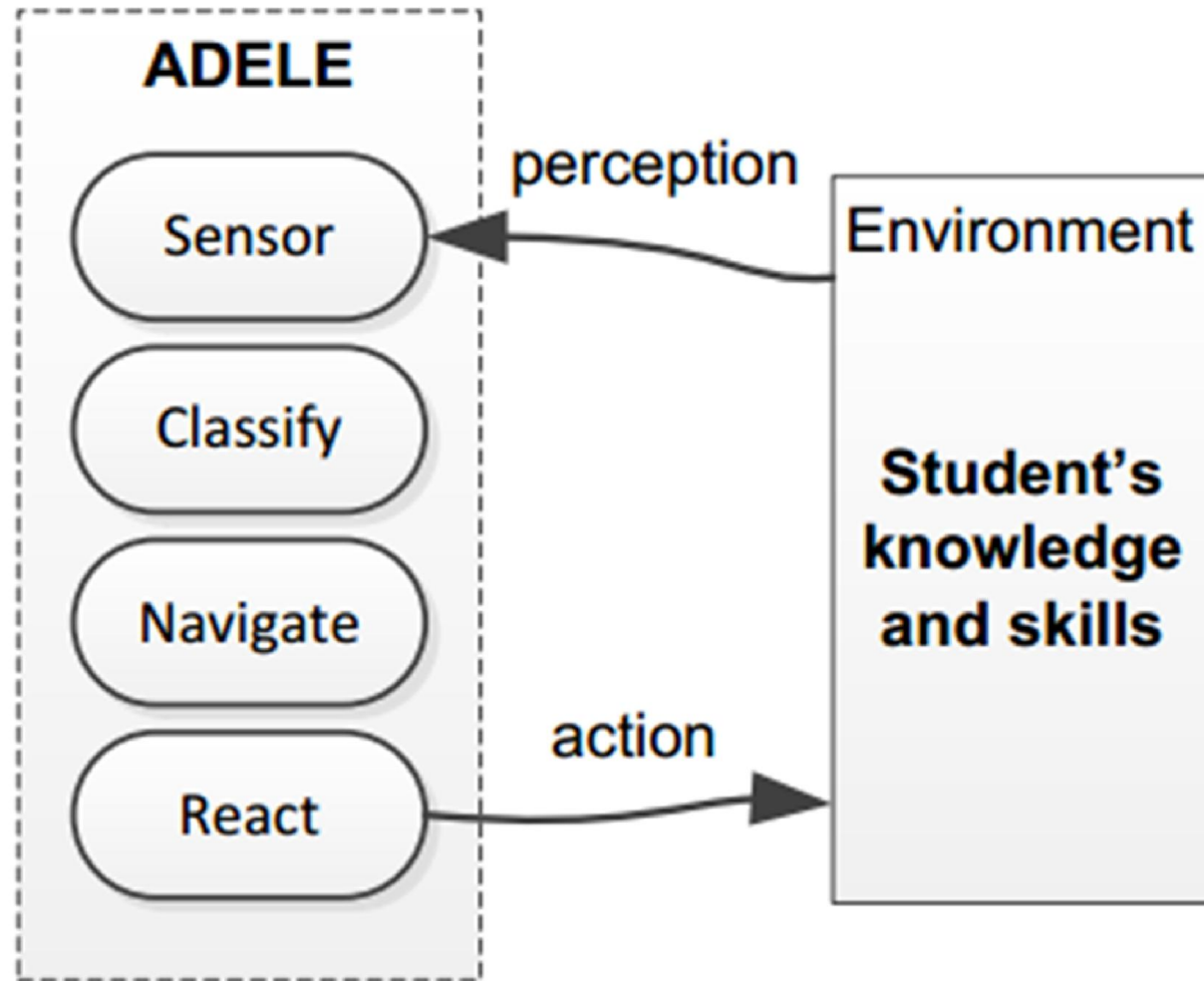
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ADELE workflow concept

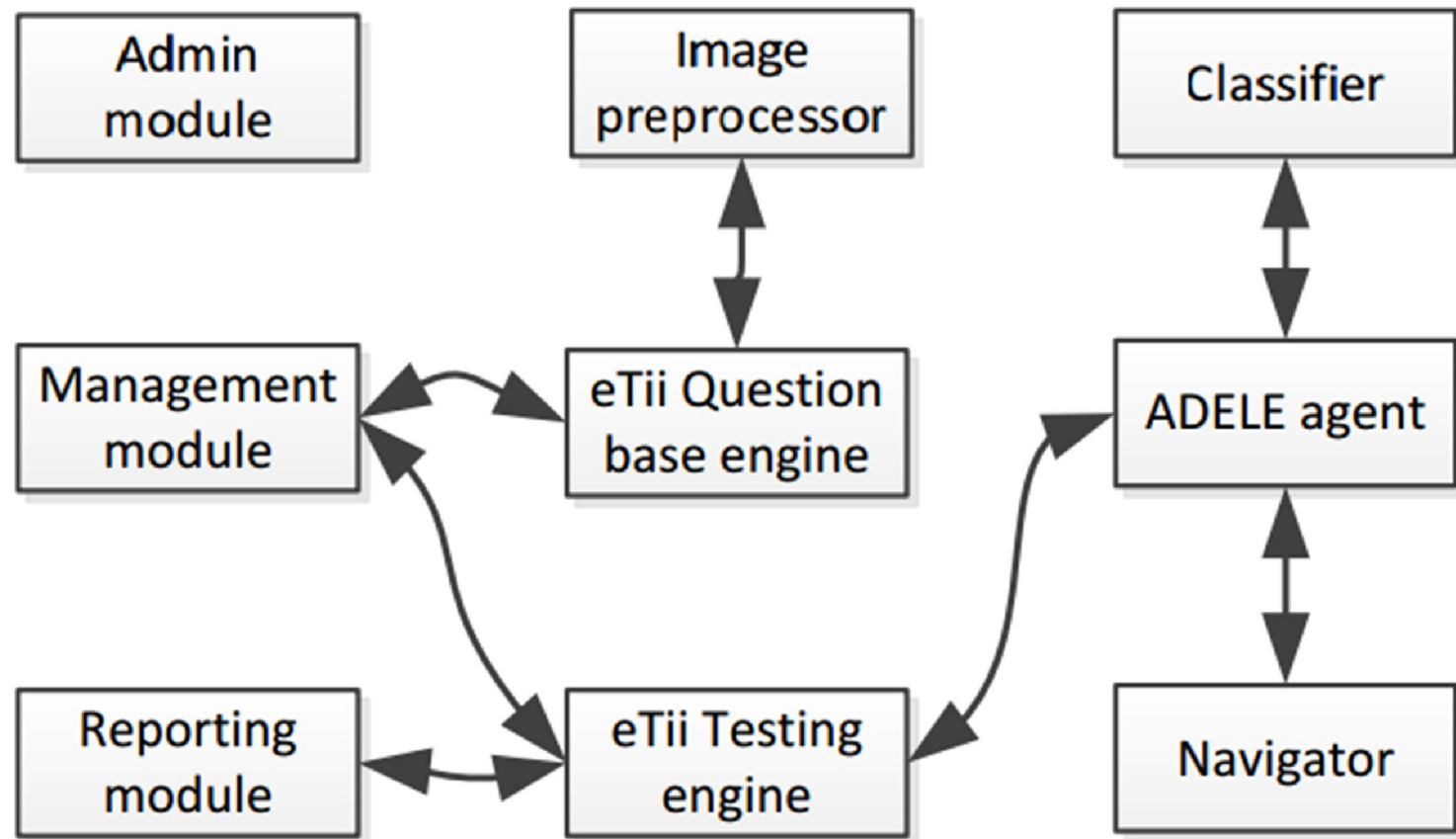# ADELE Intelligent Software Agent

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ADELE Agent Architecture

- Intelligent agent software functionality
  - Communication with sensor, classifier, navigator
- Classifier
  - Classification algorithm and pass and fail decision
- Navigator
  - Navigation in the knowledge levels and LOs (Learning Objectives)

ADELE Architecture

ADELE eTesting Module

- eTii Testing engine
  - E-Testing functionalities with interactive images
- eTii question base engine
  - Fill questioning data base with interactive images

ADELE Architecture

- **Image pre-processor**
  - Process images for exploitation as interactive images
- **Reporting module**
  - Prepares and presents reports, statistics and analytics
- **Management module**
  - Responsible for management of classes learning sessions and overall system realization of a course
- **Admin module**
  - Administration of courses, users, authentication authorization and security

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Discussion

- Motivation
  - Include interactive images instead of classical multiple choice questions
  - More precise evaluation of student knowledge and skills
  - More expressed collaboration
  - Better understanding
  - Avoiding cheating

Discussion

- ## Obstacles
  - Enabling high resolution image presentation (size limitations)

- ## Solution
  - Presenting only part of the pictures

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Conclusion & Future Work

- ADELE
  - Adaptive
  - Intelligent
  - Modulated
  - Improves the learning experience
- In Future
  - Test multiple strategies
  - Development of questions

THANK YOU FOR YOUR ATTENTION

- QUESTIONS?