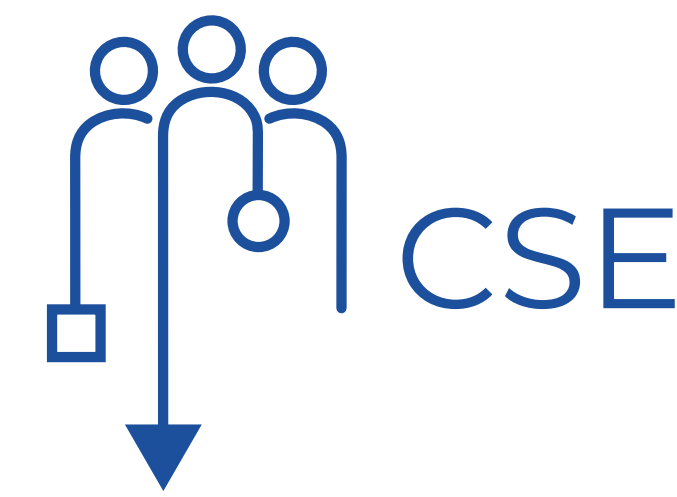


## MOTIVATION

OpenPatch had its starting point in our wish to improve empirical studying of the structure of programming competencies. Firstly, we used to conduct our studies using pen-and-paper test which led to a very time-consuming digitization of the results to be able to perform

further analyses. This also kept us from conducting larger studies, because they would be increasingly difficult to manage. Secondly, we were not pleased with the item formats we could use in a pen-and-paper test. We wanted to enclose more complex and authentic formats.

And thirdly, as we conduct most of our studies in schools or in university courses, we regard it as an important aspect to provide feedback as soon as possible. So we decided to move our assessments and empirical studies away from pen-and-paper to an online platform.



**RESEARCHER**  
Mike Barkmin  
mike.barkmin@uni-due.de  
University of Duisburg-Essen

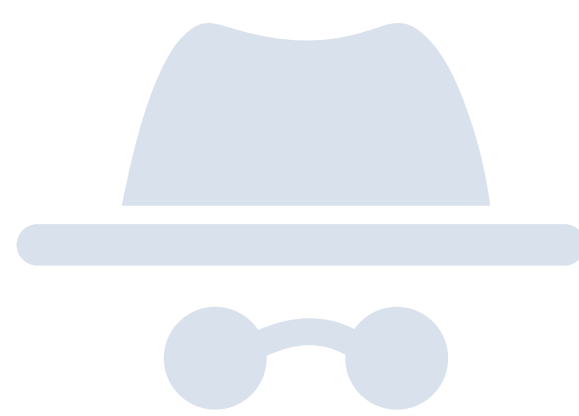
# OPEN PLATFORM FOR ASSESSMENT AND TRAINING OF COMPETENCIES: OPENPATCH

## CORE FEATURES

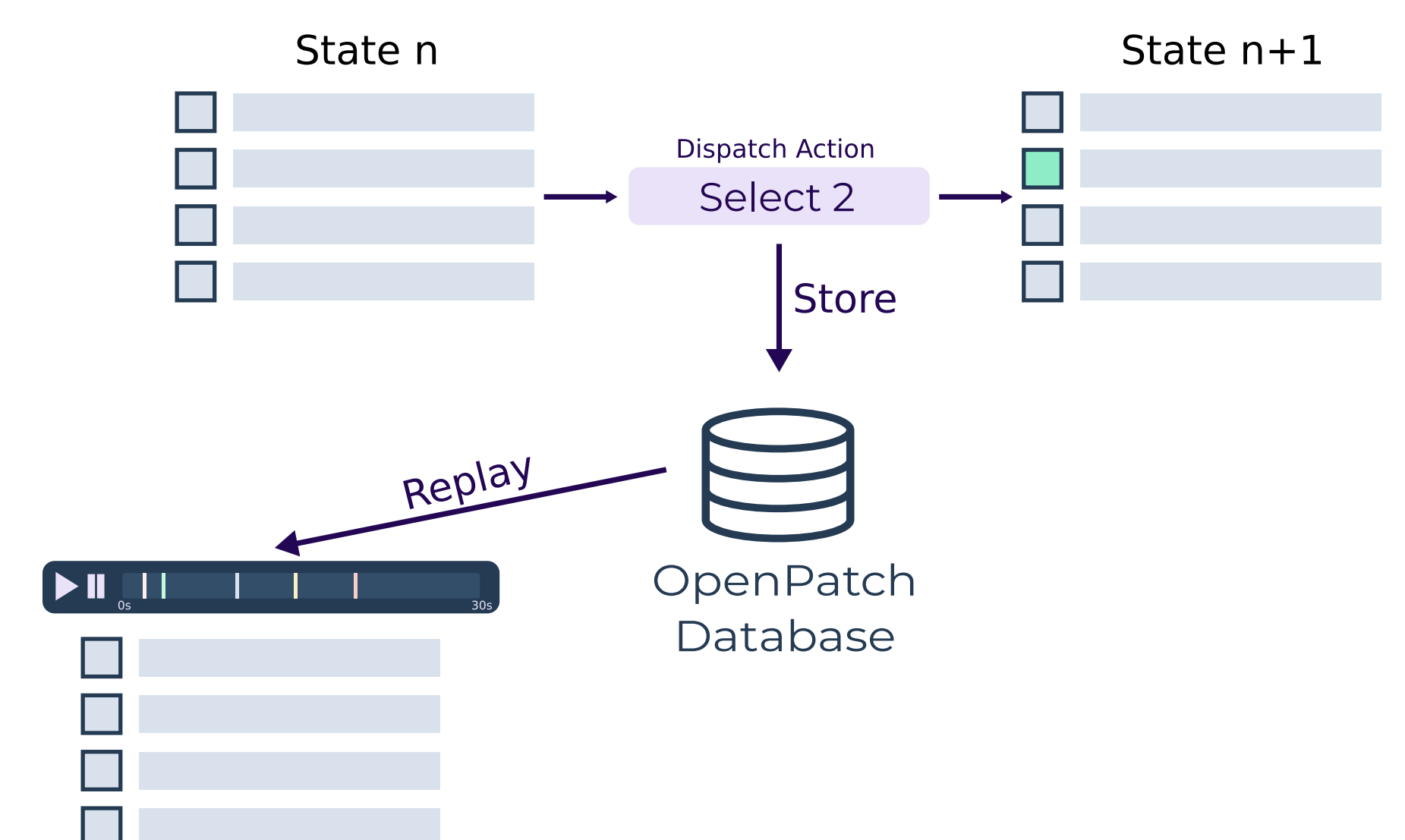
- 1 WEB APPLICATION**
- Frontend implemented in React
  - Compatible with modern browsers
  - Partially optimized for mobile browsers



- 2 NO USER ACCOUNT**
- Participants do not need a user account on the platform
  - Participants can not be tracked across assessments on the platform by default
  - Assessment can be accessed by a unique url and protected by a password



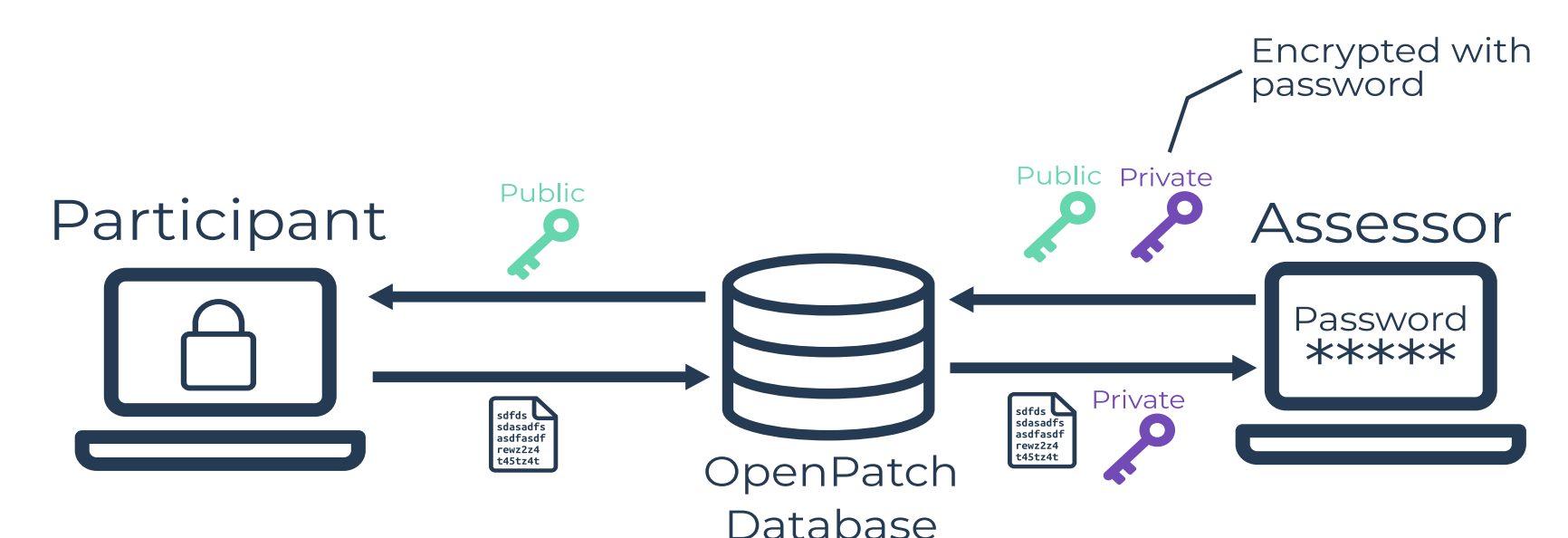
- 3 CAPTURE INTERACTIONS**
- Every interaction of participants with an item can be recorded
  - Recordings can be viewed in a media-player



- 7 ANALYSIS AND DOWNLOAD OF SUBMISSION DATA**
- Data can be downloaded as JSON
  - OpenPatch provides means to visualize the results of an assessment

```
public Car {
  private double speed;
  public double getSpeed() {
    return this.speed;
  }
  public void setSpeed(double speed) {
    this.speed = speed;
  }
}
```

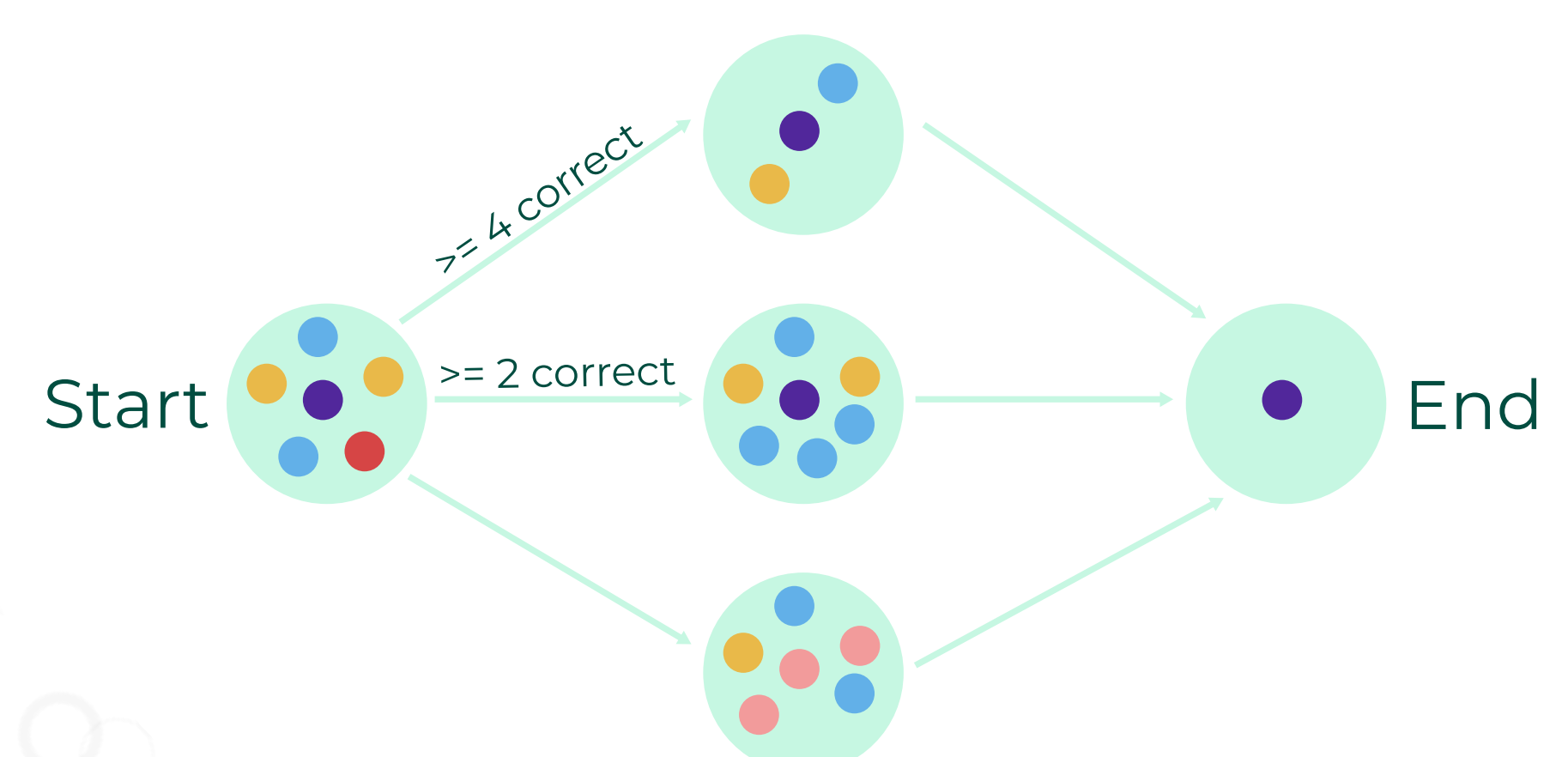
- 4 GENERAL DATA PROTECTION REGULATION**
- Parts of assessments can be declared sensitive
  - Sensitive parts will be encrypted with PGP on the client
  - OpenPatch has zero-knowledge about the content of sensitive parts



- 5 ITEMS AND TESTS**
- 13 answer formats are supported
  - All answer formats can be automatically evaluated and visualized
  - Tests can either be linear or multi-staged

Multiple Choice  
Parsons Puzzle  
Fill-in-the-blank  
Coding (Java, Python)  
Highlight ...

- 6 EXTENDABLE TO SUPPORT NEW ANSWER FORMATS**
- OpenPatch is open source
  - Tutorials on how to add a new format exist
  - Tutorials on how to add a new code executor for supporting new programming languages exist



## FUTURE

Concept Maps **SQL**  
Computer-Adaptive Testing  
Extend Library  
Support Training  
DECENTRALIZED ASSESSMENTS  
API FOR CUSTOM INTEGRATION

- in progress
- PLANNED
- idea



VISIT AND TRY  
OPENPATCH.APP