



# Seminar, Projects, Labs Topics @AI4 SS 2019

Applied Computer Science IV  
University of Bayreuth



Teaching and Research Topics

# WHAT WE DO AT AI4

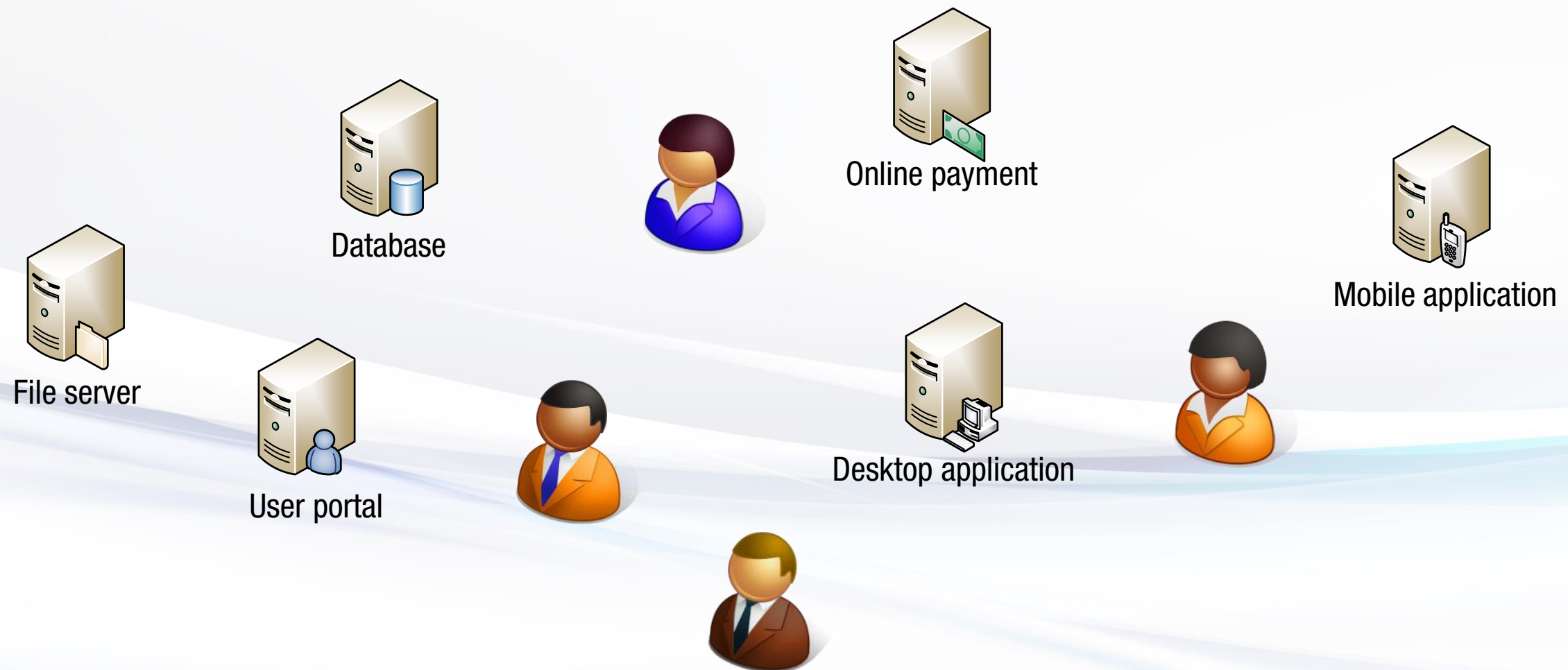


# What we are doing at AI4 - Basics



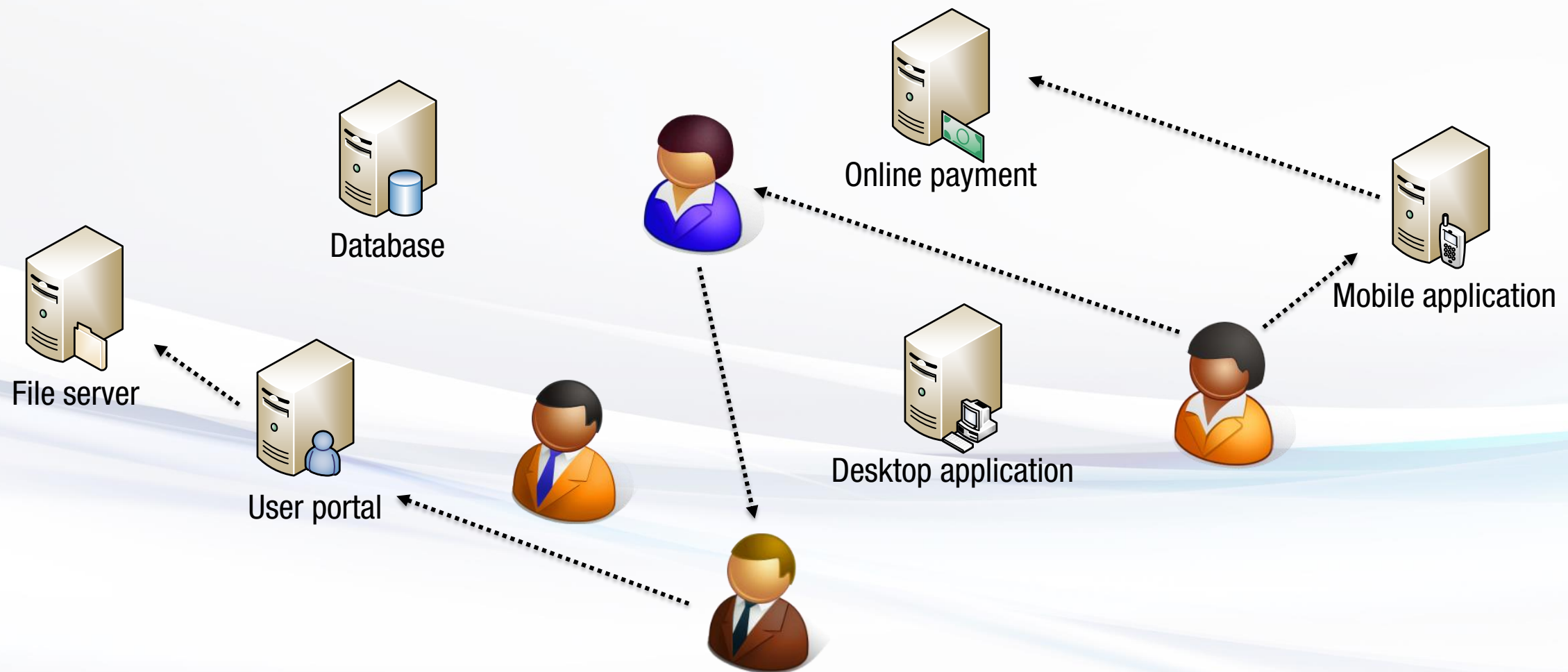
# What we are doing at AI4 – Research in Process Management

In organisations **many kinds of systems and people** work together...



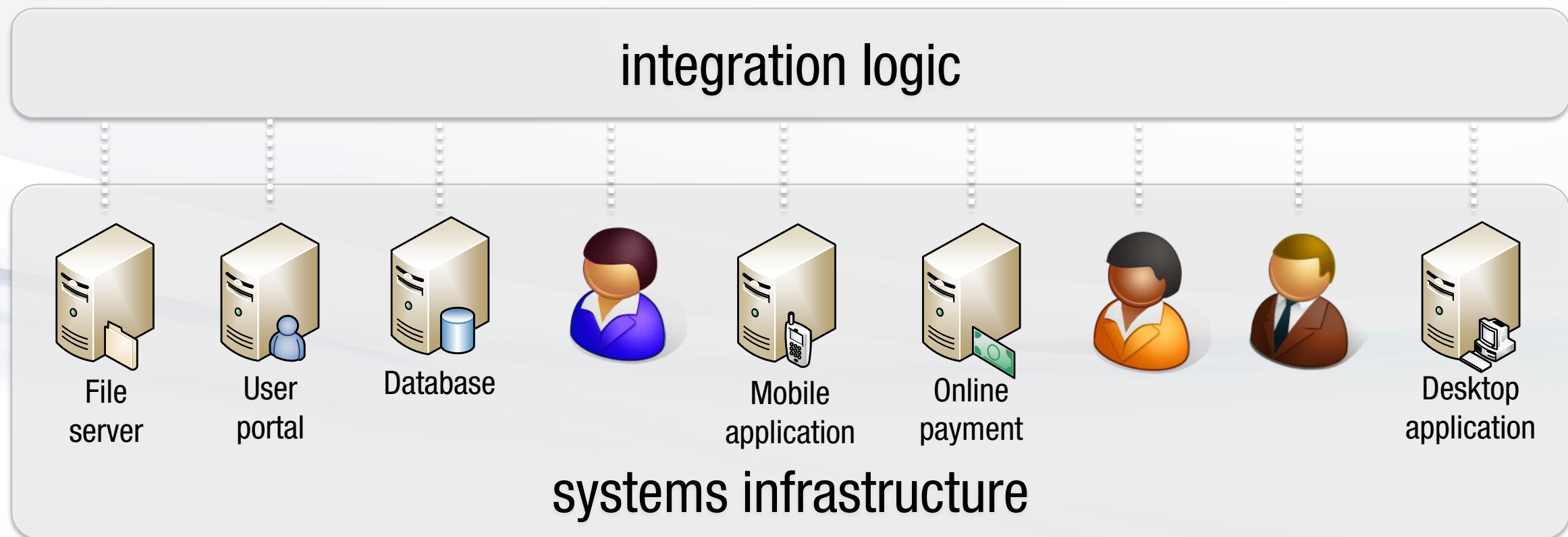
# What we are doing at AI4 – Research in Process Management

In organisations **many kinds of systems and people** work together...

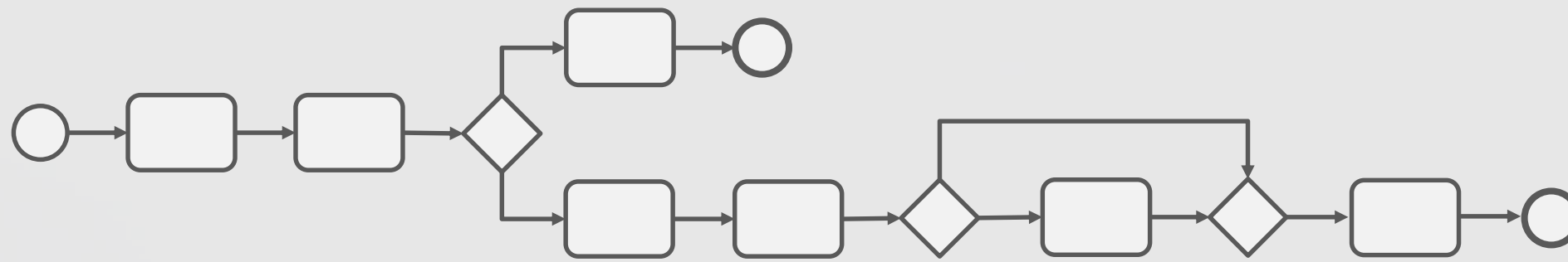


# What we are doing at AI4 – Research in Process Management

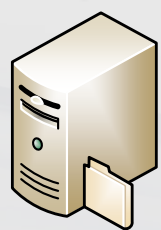
Easier to integrate if the integration logic can be defined separately from the systems and people



# What we are doing at AI4 – Research in Process Management



**business process**



File server



User portal



Database



Mobile application



Online payment



Desktop application

**systems infrastructure**





# Seminar Topics

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# Seminar „Data Analysis“ \*

## Trust und Small Data

- Topic 1: Anwendungen von Trusted Data (Bachelor)
- Topic 2: Erklärer-Modell LIME (Master)
- Topic 3: Data Augmentation Techniken für Small Data Sets (Bachelor)

## Data Mining Klassifikation (Bachelor)

- Topic 4: Support Vector Machines (Bachelor)
- Topic 5: K-Nearest Neighbour und Naive Bayes (Bachelor)

## Data Mining Klassifikation (Master)

- Topic 6: Decision Trees and Random Forests (Master)
- **Topic 7: Boosting Verfahren (AdaBoost, XGBoost, CatBoost) (Master)**

Supervisor: Dr. Stefan Schönig, Martin Käppel, Nicolai Schützenmeier

\*) Recommendations for BA / MA in brackets

# Seminar „Process Management“ \*

## Prozessmodellierungssprachen (Bachelor)

- Topic 1: Decision Modeling and Notation (DMN)
- Topic 2: Prozess-Landkarte (Process Landscape Model)
- Topic 3: Case Management Modeling and Notation (CMMN)

## Advanced Process Management (Master)

- **Topic 4: Mobile Process Execution**
- Topic 5: Logikformalismen deklarativer Prozessmodellierungssprachen
- Topic 6: Recommender-Systeme für Prozessmanagement

Supervisor: Dr. Stefan Schönig

\*) Recommendations for BA / MA in brackets





# Projects @AI4 WS 2018/2019

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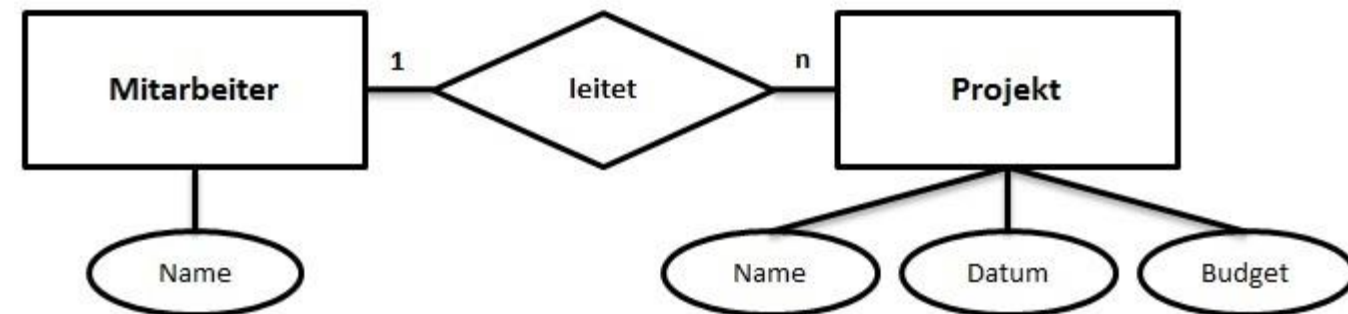
Bachelor (Praktikum/Projekt)  
Master (Small/Big Project)



# Data Analysis: ER-Modellierer (Bachelor-Projekt)

In diesem Projekt implementieren Sie das Backend eines ER-Modellierers, der es erlaubt die Elemente (Entitäten, Beziehungen, etc.) modellbasiert umzusetzen. Insbesondere ist eine SQL DDL Codeerzeugung hierbei vorgesehen.

- Gruppen-Projektarbeit
- Anerkennung für B.Sc. Projekt und Praktikum
- 1 Gruppe (bis zu 5 Personen)



Supervisor: Nicolai Schützenmeier, Martin Käppel, Dr. Stefan Schönig

# Data Analysis: Anwendung von ML Verfahren (Master-Projekt)

In diesem Projekt analysieren Sie den Zusammenhang zwischen Wirtschaftskrisen und dem Wahlverhalten auf Basis verschiedenen vorhandener Datensätze.

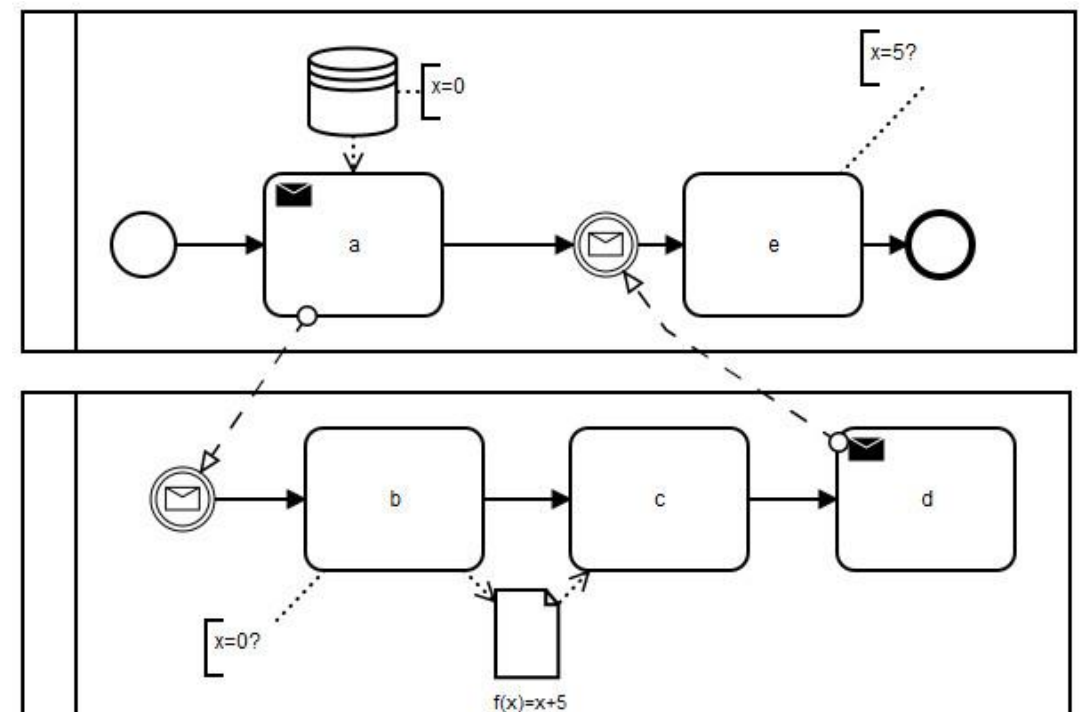
- Gruppen-Projektarbeit
- Anerkennung für M.Sc. KI. Projekt
- 1. Gruppe (5 KI. Master Projekte)

Supervisor: Nicolai Schützenmeier, Martin Käppel

# Prozesse: Prevention of Manipulation of Process Data and Data provenance

Processes with more than one participant tend to interchange data. Currently there is no tool, framework or similar to verify the correctness of the shared data. Therefore we need a tool which allows us to be sure that the information in a multi participant process is valid and not manipulated. Besides there is no tool which allows us to see the history of each manipulation of the data in a process. Similar to the ACID principle we want to have an option to see each manipulation of data in each task which occurred before by using a blockchain and restore the history of the data through the stored transactions.

- Create a blockchain environment which allows smart contracts (e.g. Ethereum)
- Write plugin for Camunda which allows to receive and send information from and to the blockchain
- Make the history of the data available at each task by restoring it from the blockchain
- Build a nice application around the tool
- 1. Group (2 Big Master Projects, 4 Small Master Projects)



Supervisor: Severin Selmaier, Christian Sturm, Dr. Lars Ackermann



# Outline Projects and Seminars

Project Topic	Bachelor	Master	Capacity	Reserved
ER Modellierer	✓		5	
Data Set Generator		✓	5	assigned
Application of ML		✓	5	
Prevention of Manipulation of Process Data		✓	5	

Seminar Topic Group	Bachelor	Master	Capacity / Topics	Reserved
Trust and Small Data	✓	✓	3	
Data Mining Classification	✓	✓	4	

Process modelling	✓		3	
Advanced Process Management		✓	3	

# How to continue...

1. Decide for a type of course and a topic, if possible in groups already

## 2. Registration / Anmeldung

- Write an email with Name, StudentID, Topic and Type (Seminar, Lab, Project) to [stefan.schoenig@uni-bayreuth.de](mailto:stefan.schoenig@uni-bayreuth.de) and [sekretariat-ai4@uni-bayreuth.de](mailto:sekretariat-ai4@uni-bayreuth.de)
- With a registration you **COMMIT** to participate (Anmeldung **verpflichtet** zur Teilnahme!)
- **Deadline, Friday, 26.04.2019**

3. Visit our website <http://ai4.uni-bayreuth.de> (News) for the next appointment for your chosen type of course (**probably next Thursday, 02.05.2019**)

- Elearning Course: <https://elearning.uni-bayreuth.de/course/view.php?id=22511>