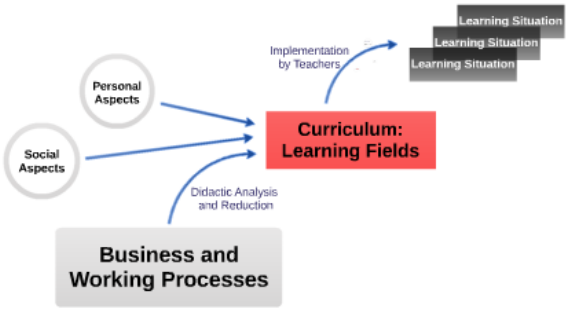
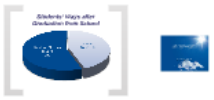
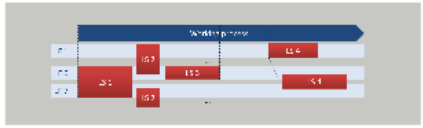
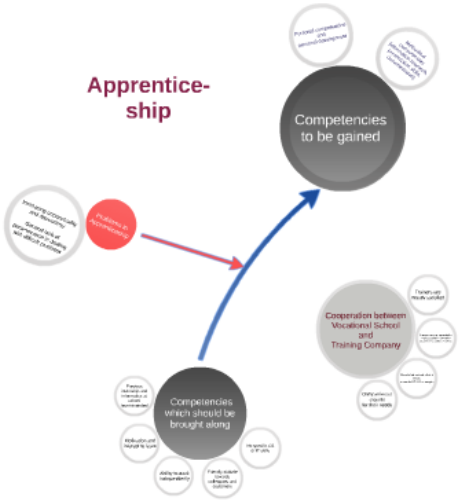

Learning Situation
Learning Situation
Learning Situation
Implementation by Teachers
Personal Aspects
Social Aspects
Curriculum: Learning Fields
Didactic Analysis and Reduction
Business and Working Processes

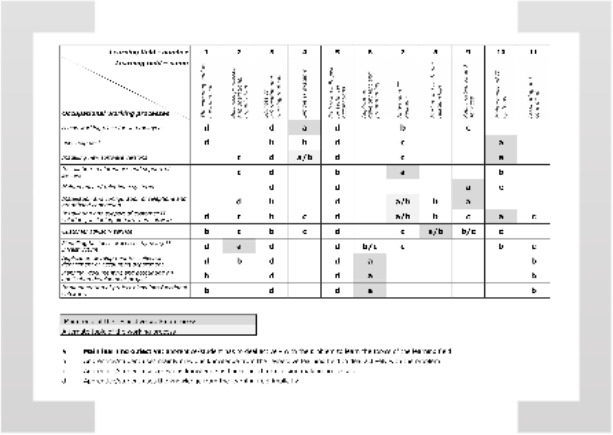



Learning situations should teach basic technical knowledge and selected topics to gain deeper understanding and skills
Each learning situation should contain documenting work and creating manuals
Consequences for Prospective Learning Situations and Further Work
Each learning situation should be connected to a working process
Only less teacher-oriented instruction should be used
Revision of the Curriculum / Learning Fields is recommended
One working process can contain several learning situations


Semi-structured guideline interviews with certified trainers of training companies for IT specialists
Approximately 1 hour each
Voice recorded
Companies were recommended by:
Teachers,
the chamber of industry and commerce
or well-known for their excellent training
Participants:




Apprentice-ship
Competencies to be gained
Competencies which should be brought along
Cooperation between Vocational School and Training Company

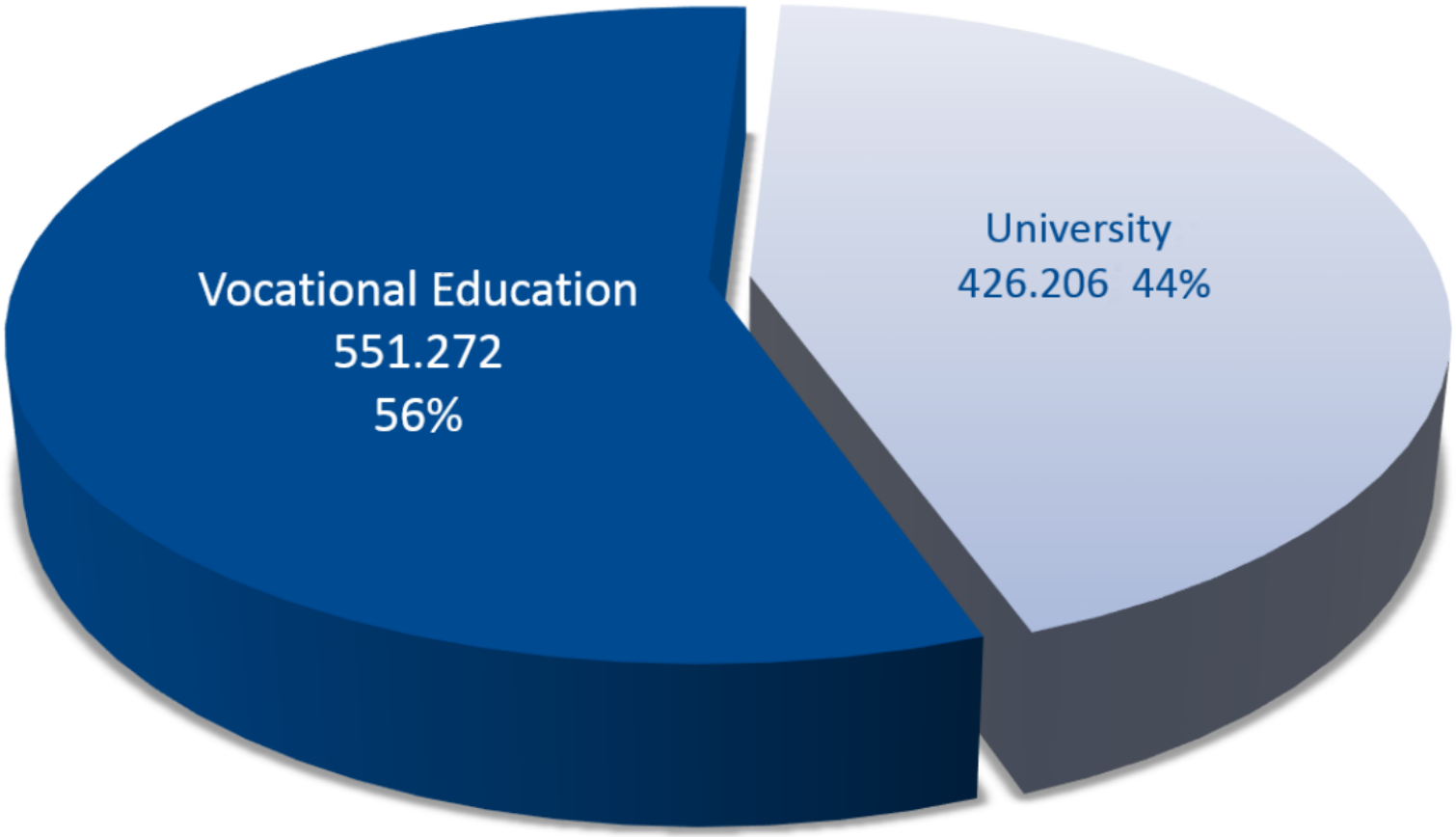


Arguments for Contextual Teaching with Learning Fields in Vocational IT Schools – Results of an Interview Study among IT and CS Training Companies

Simone Opel and Torsten Brinda

Didactics of Informatics - University of Duisburg-Essen

Students‘ Ways after Graduation from School



Germany‘s Vocational School System

Full-time vocational schools

2 – 3 years,
Final examination approved by the state
E.g. technical assistant for IT/CS

“Duale Berufsausbildung” (dual vocational education and training):
Part-time vocational school and training at a company

- 2 – 3.5 years, final examination by the chamber of industry and commerce
- Different models of school attendance
- Apprentices are employees of their training companies
- Cooperation between training company and vocational school
  - Regular meetings between all partners of learning venue cooperation
  - Training companies get information about school grades of their apprentices
- Aim of apprenticeship:
  Connection between theoretical knowledge and individual working experience

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Curricula of vocational IT and CS education demand:

- Open teaching methods
- Interdisciplinary collaborative teaching and learning
- Activity-oriented lessons
- Contextualised teaching

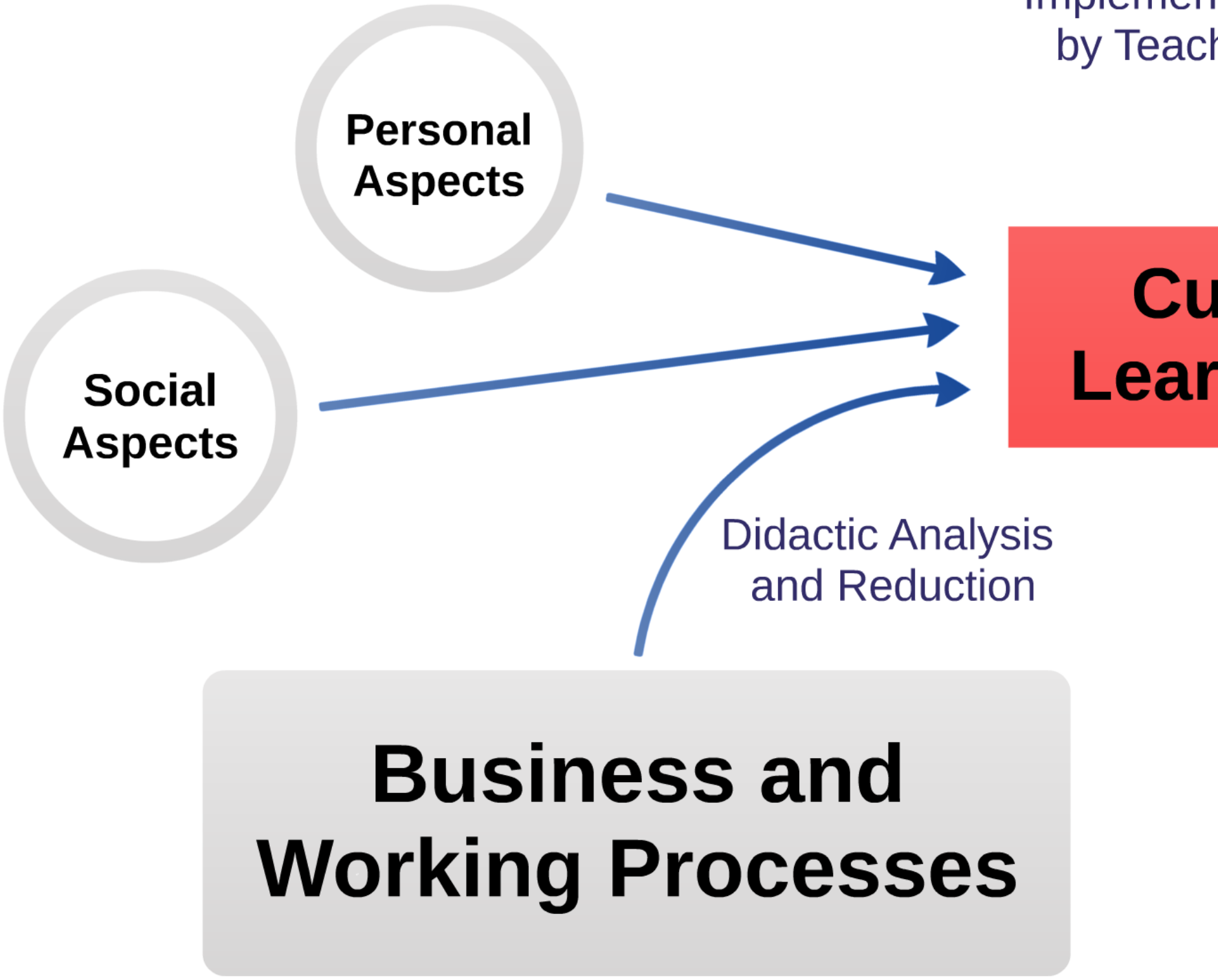
Consequence:

- Aims are described as competencies students should gain
- Curriculum consists of “learning fields” – “Lernfelder” instead of different subjects

“Learning fields are topical units, which contain didactically reduced business and working processes. They define several competencies the students should gain.” [KMK]

Didactic Analysis and Reduction

Business and Working Processes


Personal Aspects
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Curriculum: Learning Fields

ysis

on

Learning field *(first year, 60 lessons)*

Application development and programming

Aims:

The students are capable to analyse, design, implement and programme complex application systems. They design didactically reduced applications methodically and appropriately. They reflect on their approach and provide aspects of quality assurance. They apply methods of software development and implement applications based one known algorithms and data structures by using software development tools. They are enabled to reflect their strategies.

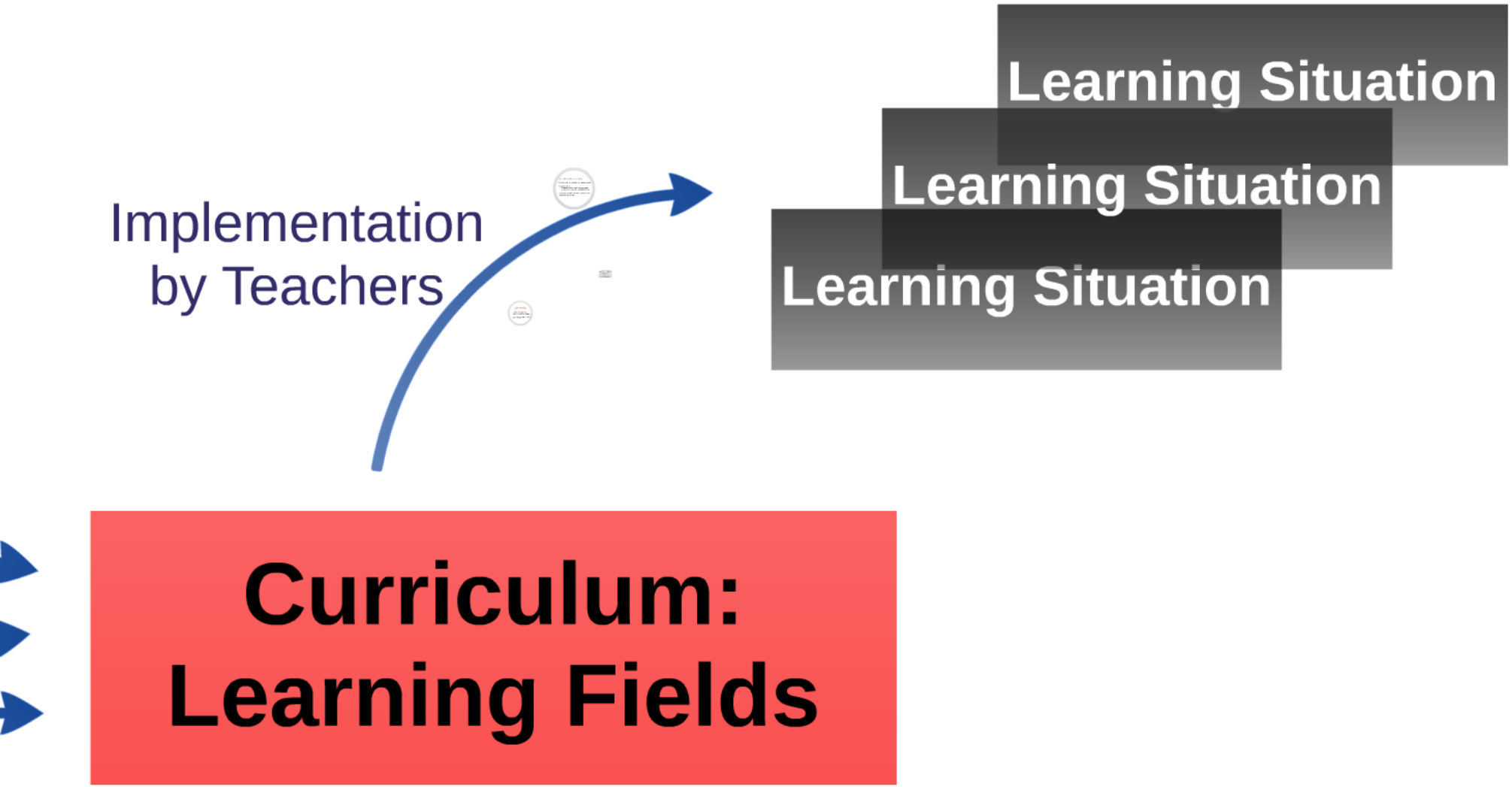
Content:

Development of application systems

- Model of project management
- Development strategies and action models for software engineering
- Methods and procedures of quality assurance
- Methods of actual analysis of business processes and IT systems
- Methods and tools for developing solution concepts and documentation

Methods of programme development

- Basic algorithms and data structures
- Structuring and documentation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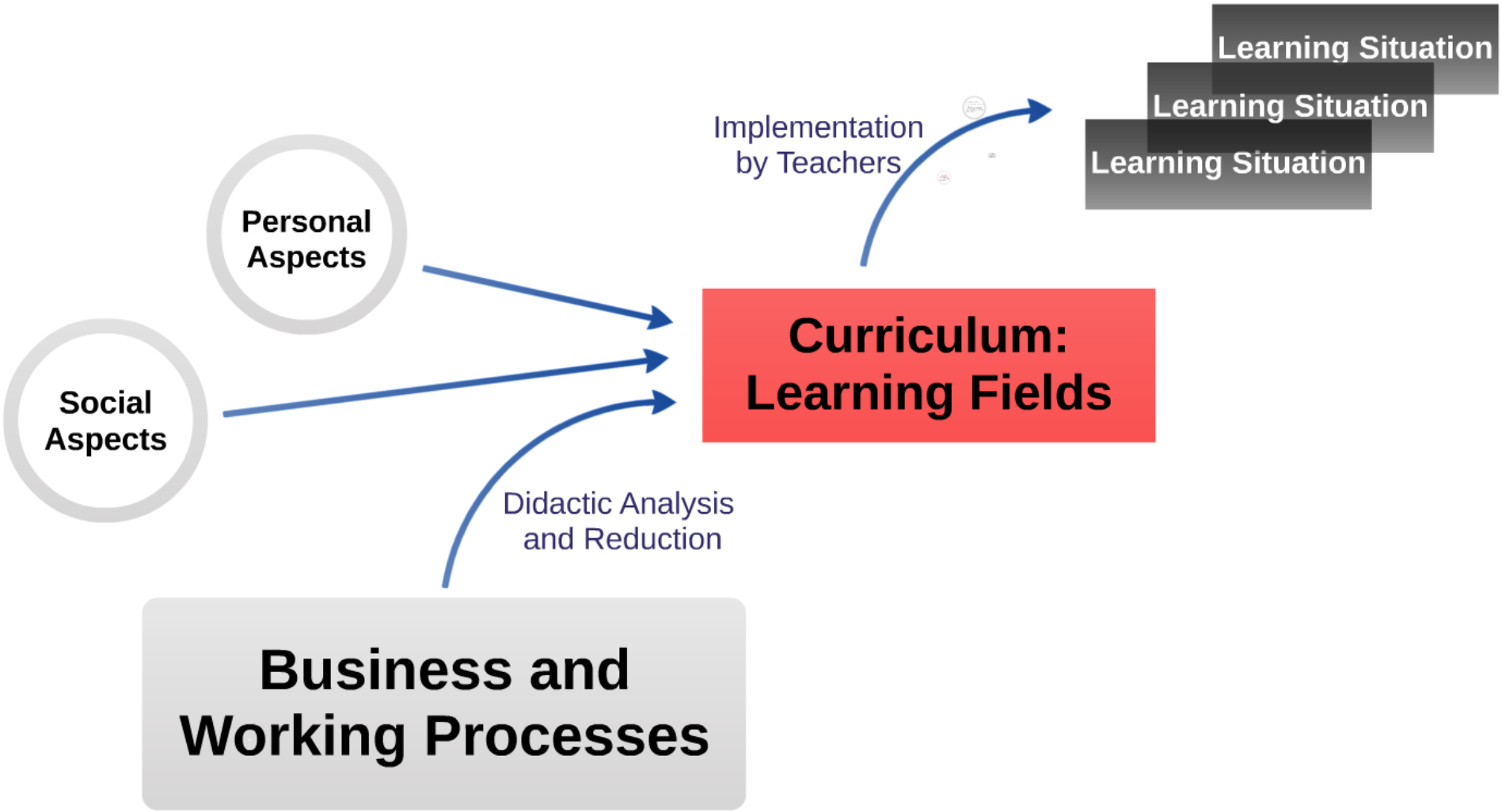
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Teachers do not put the Idea into Practice

- Lessons often follow the principle of traditional subjects
- Less usage of activity-oriented forms of teaching

Support for motivated teachers by …

- Development of a suitable competence model
- Development of
  - Examples and related teaching material
  - Guidelines for suitable learning situations
- Training the teachers how to develop learning situations on their own

Questions of the Latest Study

What are typical working processes in the field of IT and CS for an IT specialist?

How are the apprentices integrated into these processes?

Where are the links between vocational schools and training companies?

Semi-structured guideline interviews with certified trainers of training companies for IT specialists

Approximately 1 hour each
Voice recorded

Companies were recommended by:
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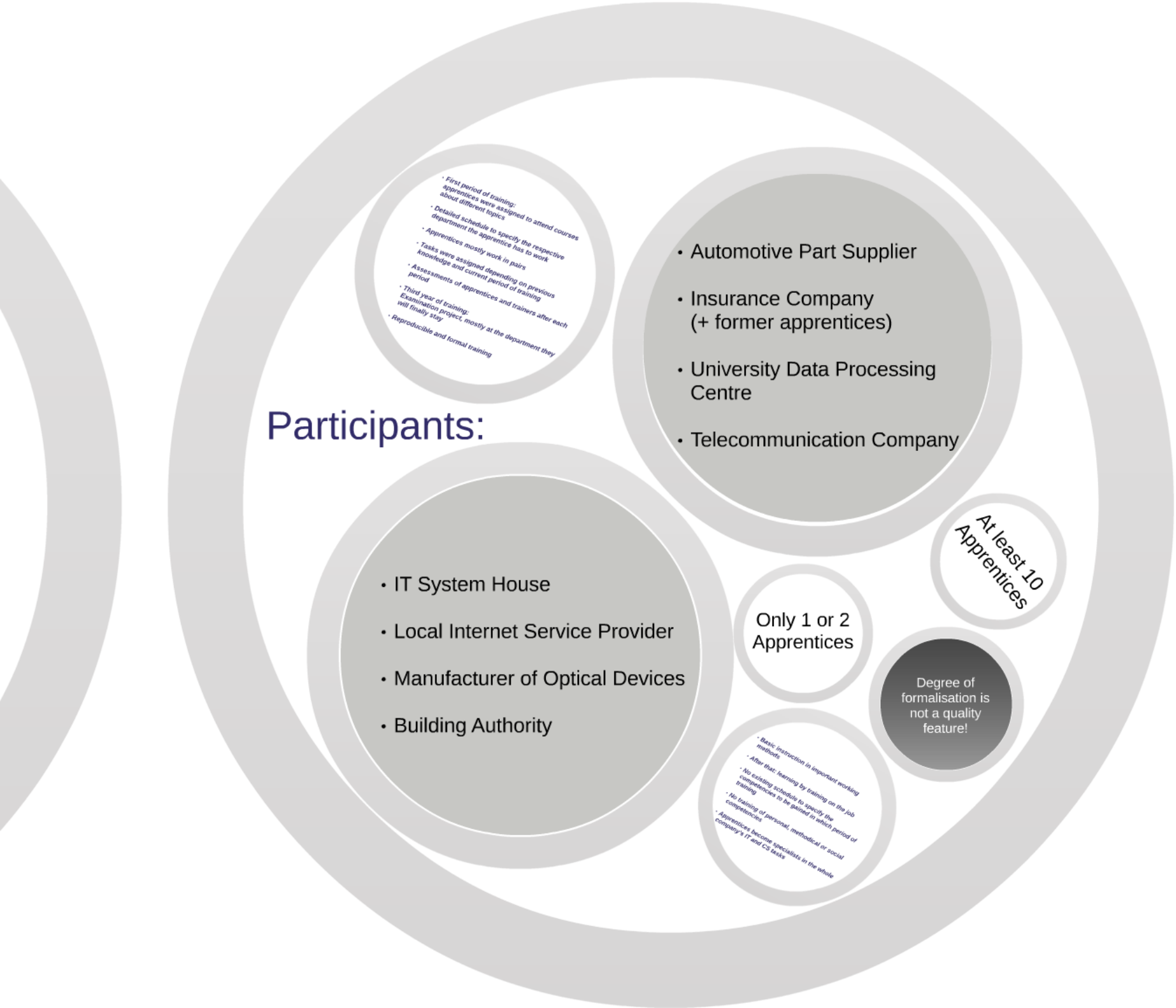
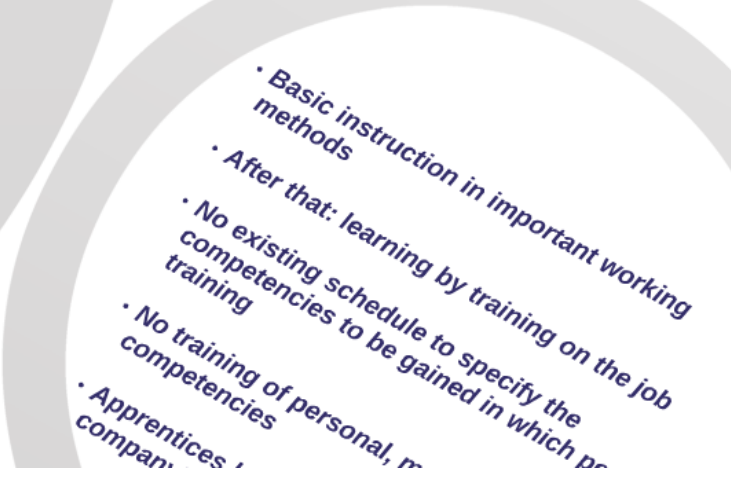

· First period of training:
apprentices were assigned to attend courses about different topics
· Detailed schedule to specify the respective department the apprentice has to work
· Apprentices mostly work in pairs
· Tasks were assigned depending on previous knowledge and current period of training
· Assessments of apprentices and trainers after each period
· Third year of training:
Examination project, mostly at the department they will finally stay
· Reproducible and formal training
Participants:
• Automotive Part Supplier
• Insurance Company (+ former apprentices)
• University Data Processing Centre
• Telecommunication Company
• IT System House
• Local Internet Service Provider
• Manufacturer of Optical Devices
• Building Authority
At least 10 Apprentices
Only 1 or 2 Apprentices
Degree of formalisation is not a quality feature!
· Basic instruction in important working methods
· After that: learning by training on the job
· No existing schedule to specify the competencies to be gained in which period of training
· No training of personal, methodical or social competencies
· Apprentices become specialists in the whole company's IT and CS tasks

Only 1 or 2 Apprentices

- IT System House
- Local Internet Service Provider
- Manufacturer of Optical Devices
- Building Authority

Only 1 or 2 Apprentices



- ***Basic instruction in important working methods***
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Degree of formalisation is not a quality feature!

Apprentice-ship


Competencies which should be brought along


Competencies which should be brought along
Previous internship and informatics at school recommended
Motivation and interest to learn
Ability to work independently
Friendly attitude towards colleagues and customers
No specific CS or IT skills

Competencies to be gained

Methodical competencies (information research, presentation skills, documentation)

Personal competencies and personal development

Problems in Apprenticeship

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Increasing unpunctuality and discourtesy

General lack of perseverance in dealing with difficult problems

Cooperation between Vocational School and Training Company

Trainers
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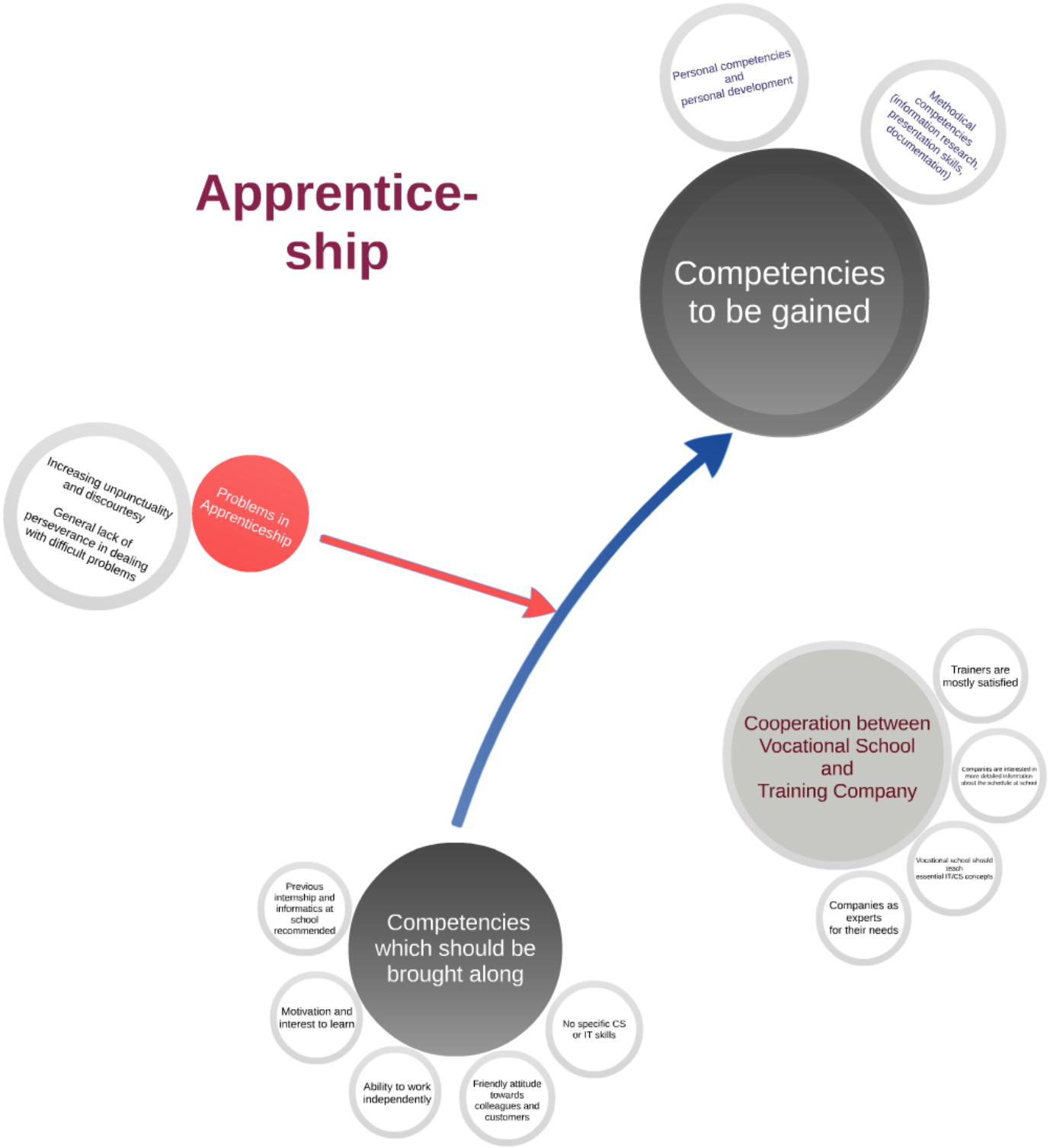
Cooperation between Vocational School and Training Company
Trainers are mostly satisfied
Companies are interested in more detailed information about the schedule at school
Vocational school should teach essential IT/CS concepts
Companies as experts for their needs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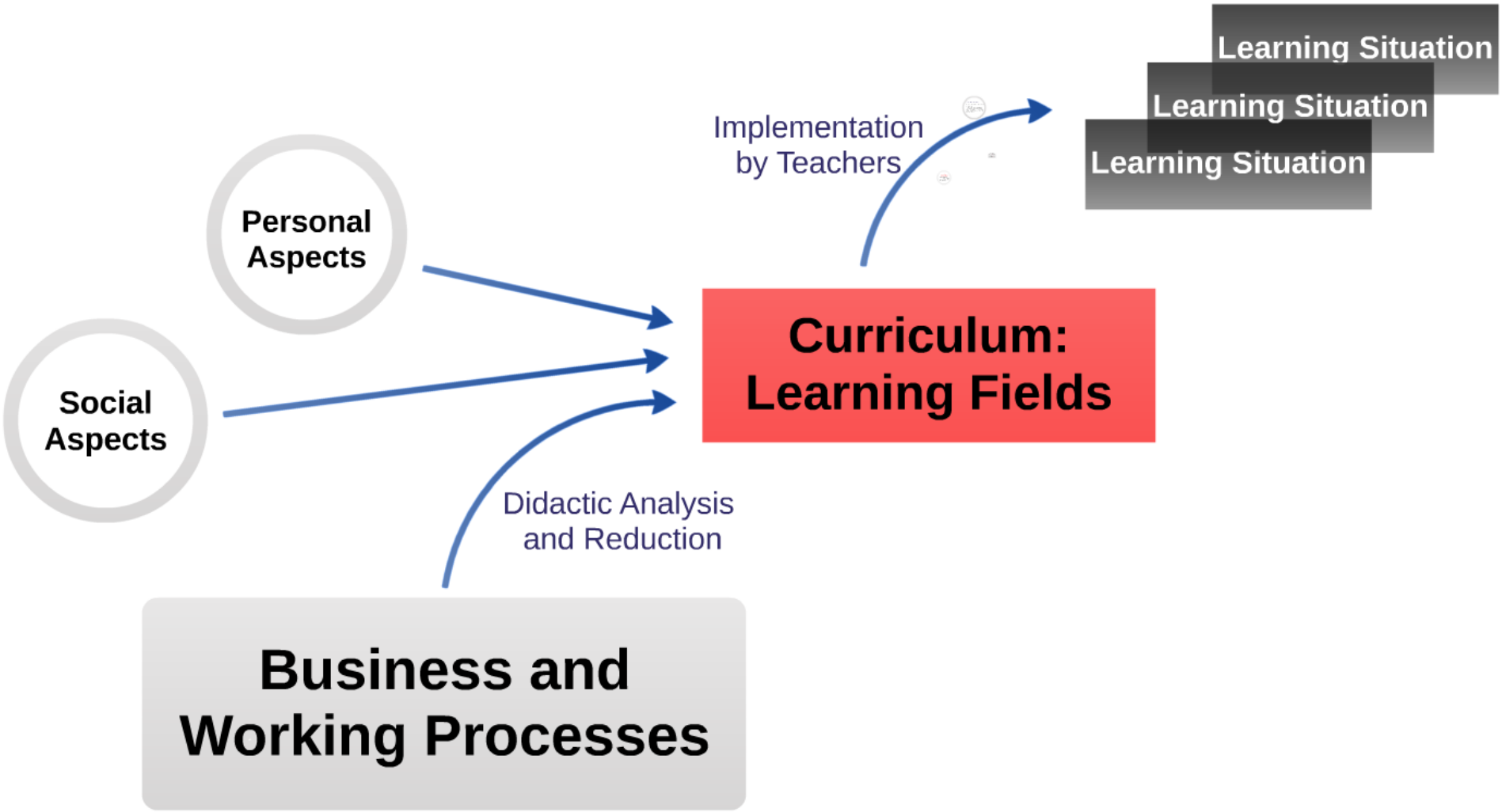
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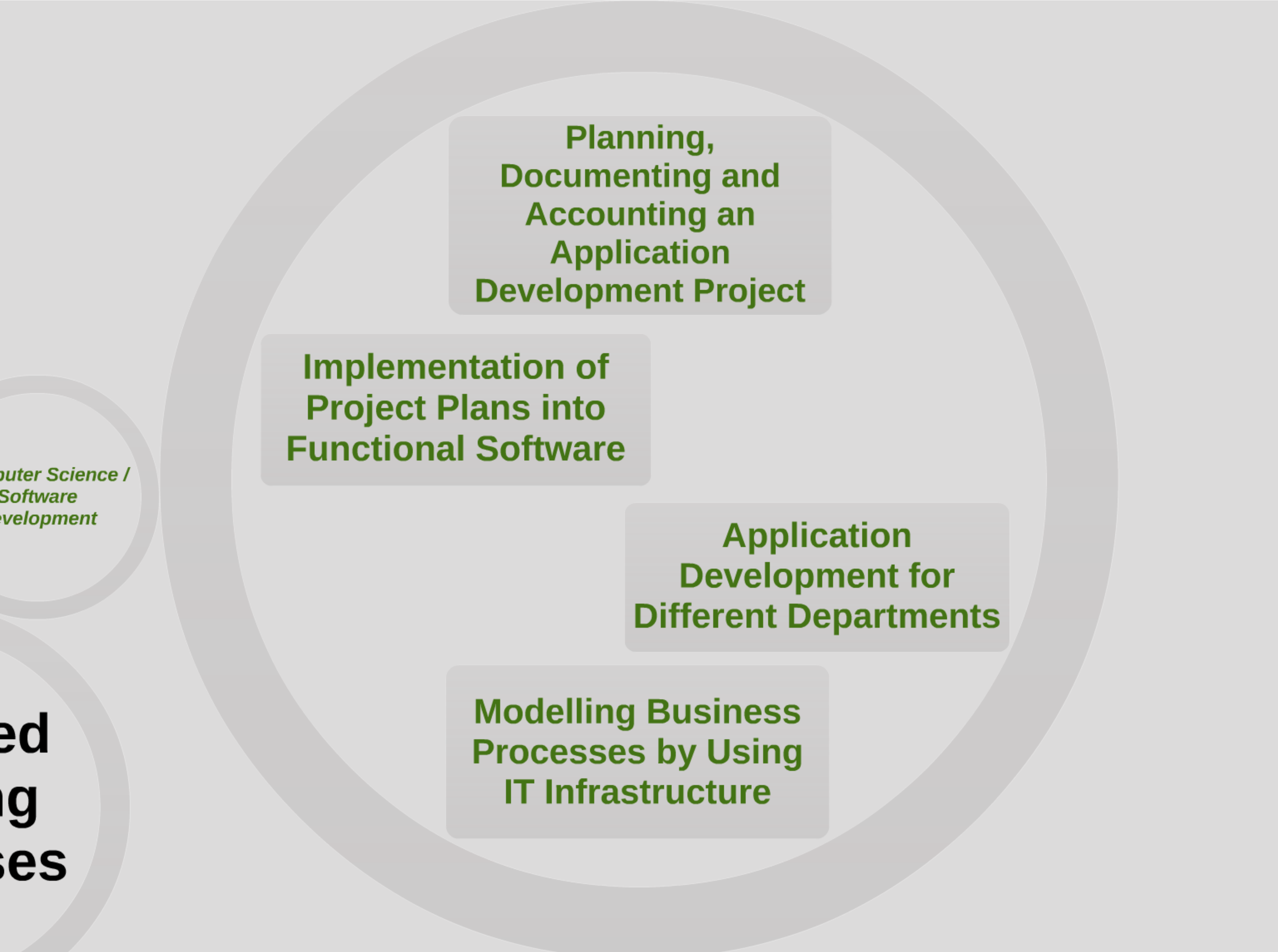
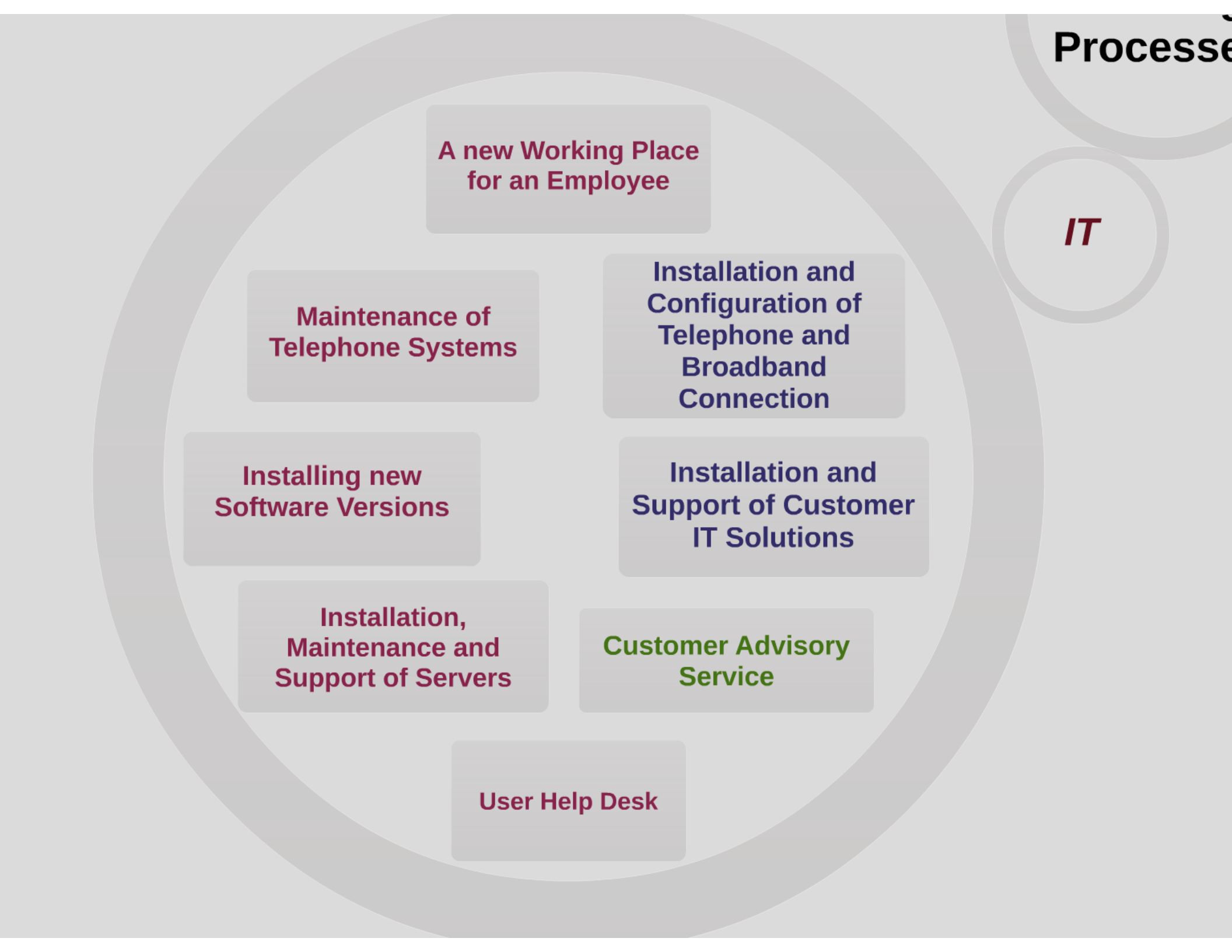
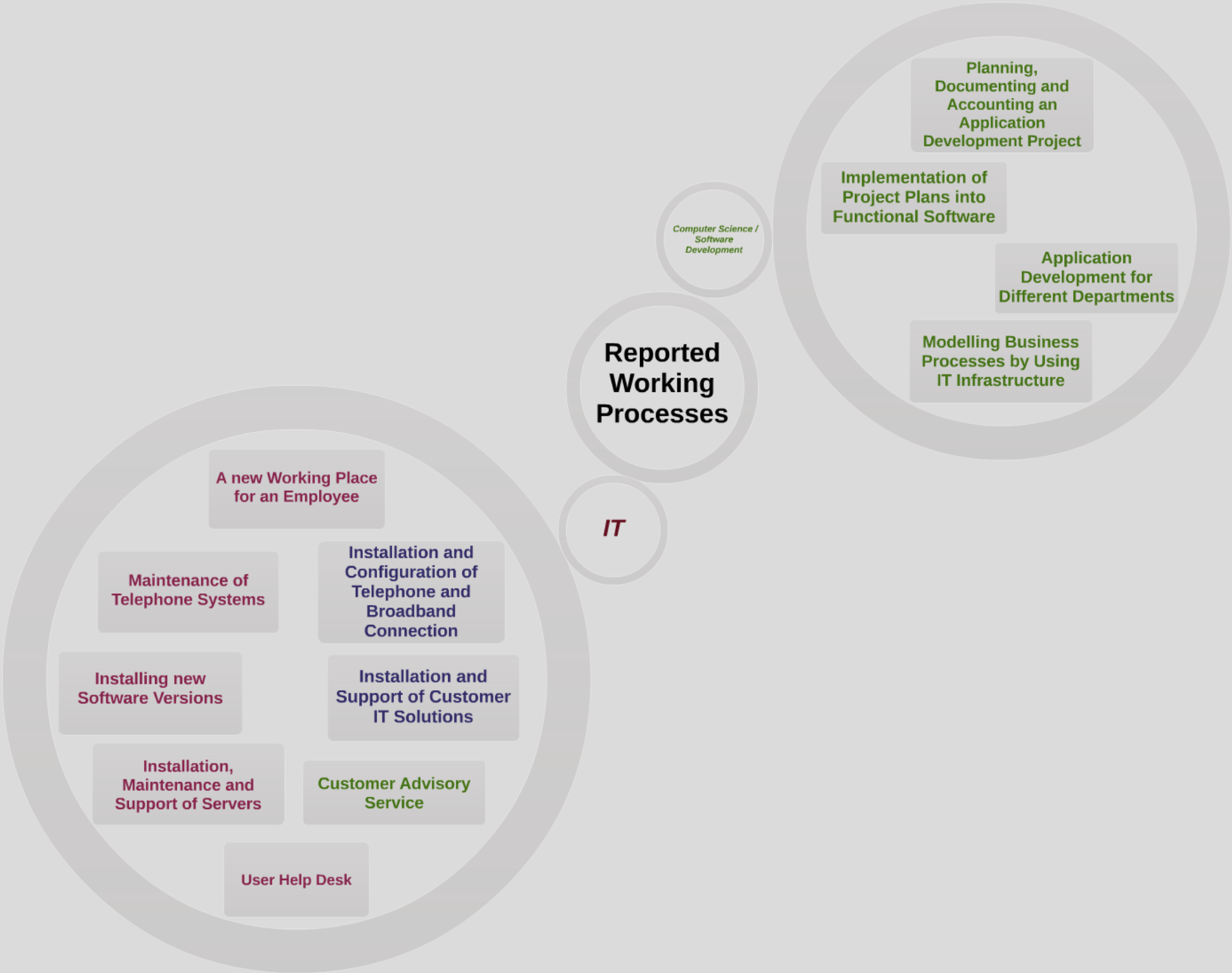
Reported Working Processes


Planning, Documenting and Accounting an Application Development Project
Implementation of Project Plans into Functional Software
Application Development for Different Departments
Modelling Business Processes by Using IT Infrastructure


Processe
IT
A new Working Place for an Employee
Maintenance of Telephone Systems
Installation and Configuration of Telephone and Broadband Connection
Installing new Software Versions
Installation and Support of Customer IT Solutions
Installation, Maintenance and Support of Servers
Customer Advisory Service
User Help Desk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Installation and Support of Customer IT Solutions
Installation, Maintenance and Support of Servers
Customer Advisory Service
User Help Desk

Learning field - number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Learning field – name / **Occupational working processes**	*The company and its environment*	*Business processes and operational organization*	*Sources of information and working methods*	*Simple IT systems*	*Professional English for technical occupations*	*Application development and programming*	*Networked IT-Systems*	*Market and customer relationships*	*Public networks and services*	*Maintenance of IT systems*	*Accounting and controlling*
A new working place for an employee	**d**		**d**	**a**	**d**		**b**		**c**		
User help desk	**d**		**b**	**b**	**d**		**c**			**a**	
Installing new software versions		**c**	**d**	**a/b**	**d**		**c**			**a**	
Installation, maintenance and support of servers		**c**	**d**		**b**		**a**			**b**	
Maintenance of telephone systems			**d**		**d**				**a**	**c**	
Installation and configuration of telephone and broadband connection		**d**	**b**		**d**		**a/b**	**b**	**a**		
Installation and support of customer IT solutions, including all hard- and software	**d**	**c**	**b**	**c**	**d**		**a/b**	**b**	**c**	**a**	**c**
Customer advisory service	**b**	**c**	**b**	**c**	**d**		**c**	**a/b**	**b/c**	**c**	
Modelling business processes by using IT infrastructure	**d**	**a**	**d**		**d**	**b/c**	**c**			**b**	**c**
Application development for collection department or accounting department	**d**	**b**	**d**		**d**	**a**					**b**
Planning, documenting and accounting an application development project	**b**		**d**		**d**	**a**					**b**
Implementation of project plans into functional software.	**b**		**d**		**d**	**a**					**b**

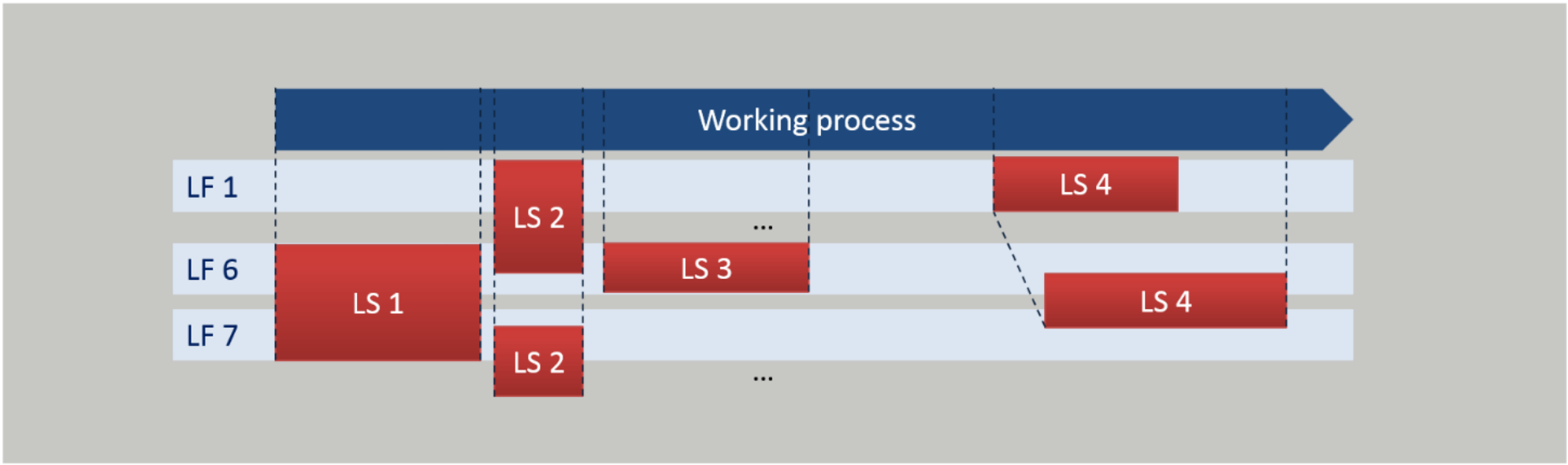
Main topic of the respective working process
Alternate topic of the working process

a: **Main learning objective**; apprentice/student has to deal actively with the problem to learn the topics of the learning field

b: Apprentice/student uses mainly previous knowledge from the respective learning field to deal actively with the problem

c: Apprentice/student uses previous knowledge as background for decision making processes

d: Apprentice/student uses the knowledge from the learning field implicitly


Working process
LF 1
LF 6
LF 7
LS 1
LS 2
LS 2
LS 3
LS 4
LS 4
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