



IntegraTUM: Information Services and University IT Governance

Arndt Bode

Vice-President and Chief Information Officer

Technische Universität München

Integration of Information Services into University Infrastructures

Frankfurt

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Unique Profile

Superb Community

- 21,000 Students 32% female
20% international
- 400 Tenured Professors
- 4040 Researchers
- 2600 Graduates p.a.
- 730 Ph.D/Habils. p.a.
- >27,000 Alumni in network

6800 Employees
12 Departments
7 Research Centers



Entrepreneurial Spirit

- **Internationality:**
 - #1 AvH Senior Research Awards
 - Off-Shore Branch Singapore
- **Fundraising** >100 M€ since 1999
- **Third Party Funding:** 147 M€ ('05)
= 31% of total Budget, #1 GER
- **Entrepreneurial Assets:**
UnternehmerTUM, TUM-Tech Ltd.,
Accounting System SAP-R/3

Innovative Strategies

- **Student Admission Assessment:** 1998 TUM-initiative pioneered State Law Amendment 2003
- **Advanced Organizational Structure:** 1999 TUM constitution pioneered Bavarian Higher Education Act 2006
- **Centers of Excellence Strategy:** Competitive restructuring program *innovaTUM* (2003) allocates 10% total TUM resources to areas of excellence until 2008
- **Social & Cultural Awareness:** Linde Academy, Gender Responsibility



Munich Region: High-Tech Cluster

- Aerospace**
- EADS
 - ESG
 - Galileo Industry
 - Astrium
 - IABG
 - Eurocopter
 - ...

- Automotive**
- BMW
 - Audi
 - MAN
 - ...

- Information and Communication**
- Siemens
 - Infineon
 - Sun
 - Intel
 - HP
 - ...

- Finance**
- Allianz
 - Bay. Landesbank
 - HypoVereinsbank
 - MünchnerRück
 - ...

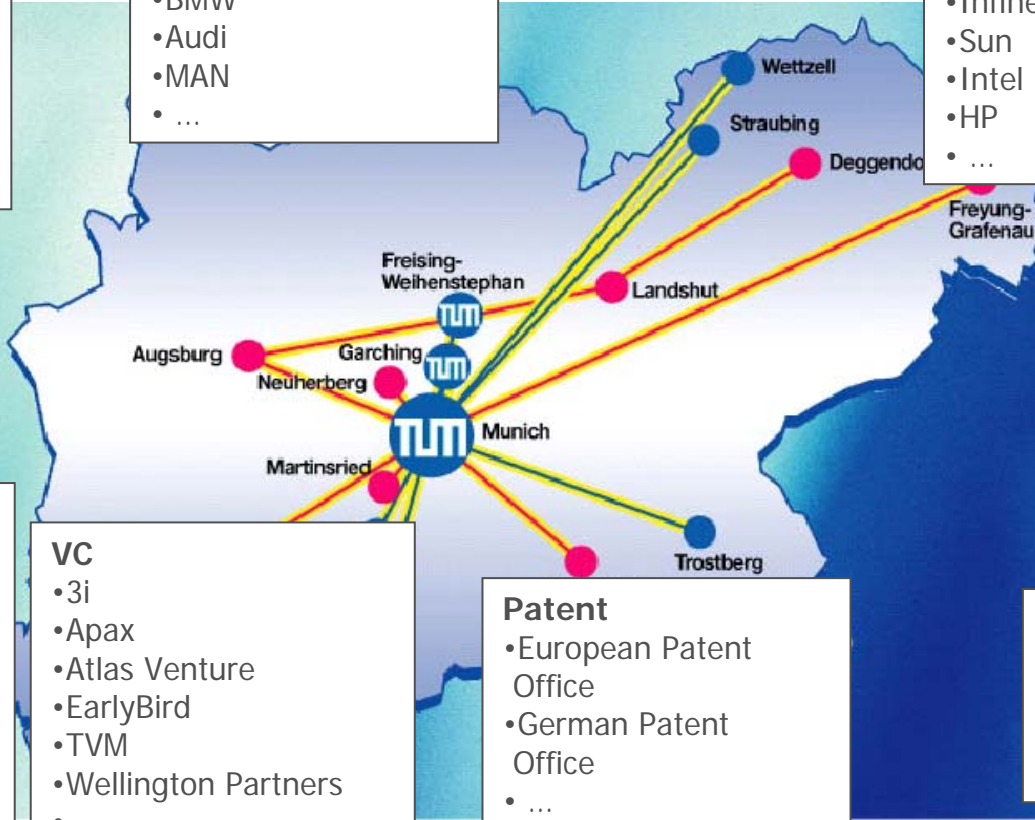
- Research**
- DLR
 - FhG
 - Max-Planck
 - LMU
 - FHM
 - TUM
 - Uni der Bundeswehr
 - ...

- VC**
- 3i
 - Apax
 - Atlas Venture
 - EarlyBird
 - TVM
 - Wellington Partners
 - ...

- Patent**
- European Patent Office
 - German Patent Office
 - ...

- Software**
- SoftLab
 - Nemetschek
 - Oracle
 - Microsoft
 - sd&m
 - ...

- Life Sciences, Media, Telecommunication, Environmental Engineering...**





Universities: Changes in Goals and Structures

- International competitiveness is key for national welfare (science and technology instead of treasures of the soil)
- Competition around quality in science and teaching
- New political conditions (India, China, Eastern Europe, greying Society, continuous education, liberalization and harmonization of university study)
- Student tuition fees
- University education as a global offering
- Secondary Schools must not be neglected



Technology Changes: The Digital University

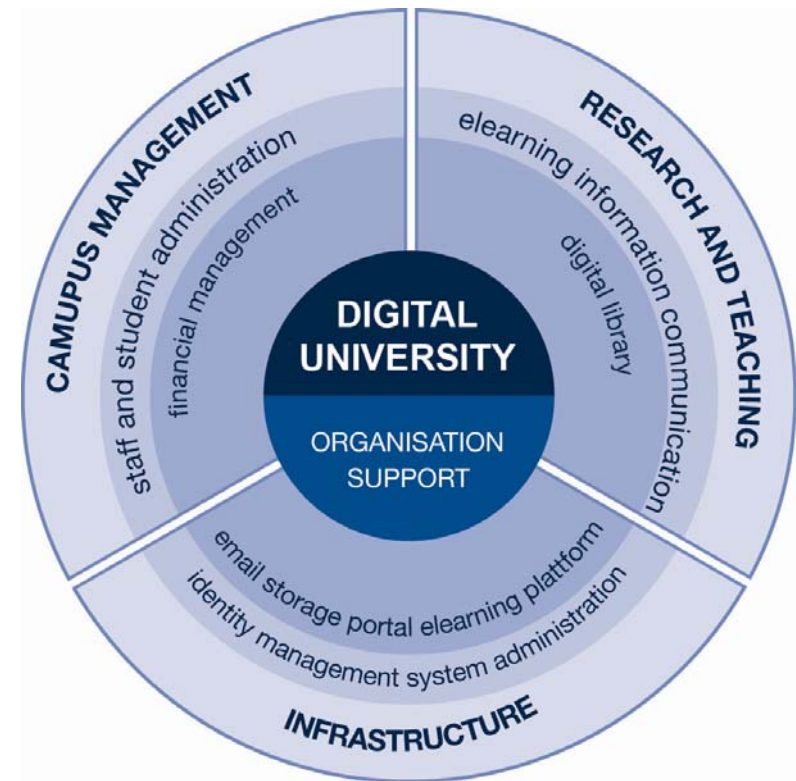
- IT ubiquitous in universities
- Historically: IT centralized-decentralized, today: recentralization needed
- University boards must recognize strategical importance of IT
 - Responsibility
 - Changes
 - Investments



The Digital University

„Efficient use of IT for research, teaching and administration“

Processes
Organization
Technology and support





IT Services for Research, Teaching and Administration

Distributed, cooperating service system consisting of 4 layers:

- | | |
|--------------------------------------|---|
| ■ IT Infrastructure | Systems and Networks |
| ■ Unified Basic Services | OS, PL, middleware, Data management, security, ... |
| ■ Heterogeneous Application Services | Software-Applications, DB, tools, Interfaces |
| ■ Service Portal | Application-oriented integration layer(s): teaching, research, administration |

Recommendations KfR: www.dfg.de



University – IT: Changes in Organization

- IuK Management structure must reflect investment and strategical importance
 - CIO and CIO-staff
 - IT-Governance Rules
 - Communication Platform: „CIO-IO“
 - Service provider: Internal – External (outsourcing - cosourcing)

- Functions of the classical Computing-Centre must be extended: multimedia, eLibrary, corporate communication, telecom, administration, eLearning, eGovernment, ...



IntegraTUM at TU München

- Extension of Portal Services
- eLearning (elecTUM)
- Extension of Digital Library Services (mediaTUM)
- Standardization of System-Administration based on LRZ-Services: email, Storage/Archiving, ...
- Campus Management
 - HR and FI (SAP@TUM)
 - Student Registration and ECTS Management (HIS@TUM)
 - Room- and Teaching Management
- Identity Management



Optimal Scenario

- Process optimization
 - Process analysis
 - Standardization of process structures
 - Customer- and Service-Orientation
- Central Identity Management
- Cooperation of University- and IT Management regarding governance (rules and structures)
- Integration of departments and administration
- Cooperation TUM and Leibniz-Rechenzentrum (LRZ), Outsourcing of IT-Services

Reorganization: Domain knowledge vs. IT-Competence



IT Projects at TUM

- IntegraTUM: integrated IT Infrastructure
- HIS@TUM: Exam and ECTS Management
- elecTUM: eLearning
- Web Corporate Design / Internet-Portal TUM
- Administration Services
 - SAP@TUM (FI, HR, CO)
 - Data Warehouse (BW@TUM)
 - Document Management (DOMEA@TUM)





Finance Status

IntegraTUM

DFG	Project
TUM	Program InnovaTUM
TUM	Basic Personal
LRZ	Basic Personal

HIS@TUM

TUM	Basic Personal
Bayer.	HWP-Program

elecTUM

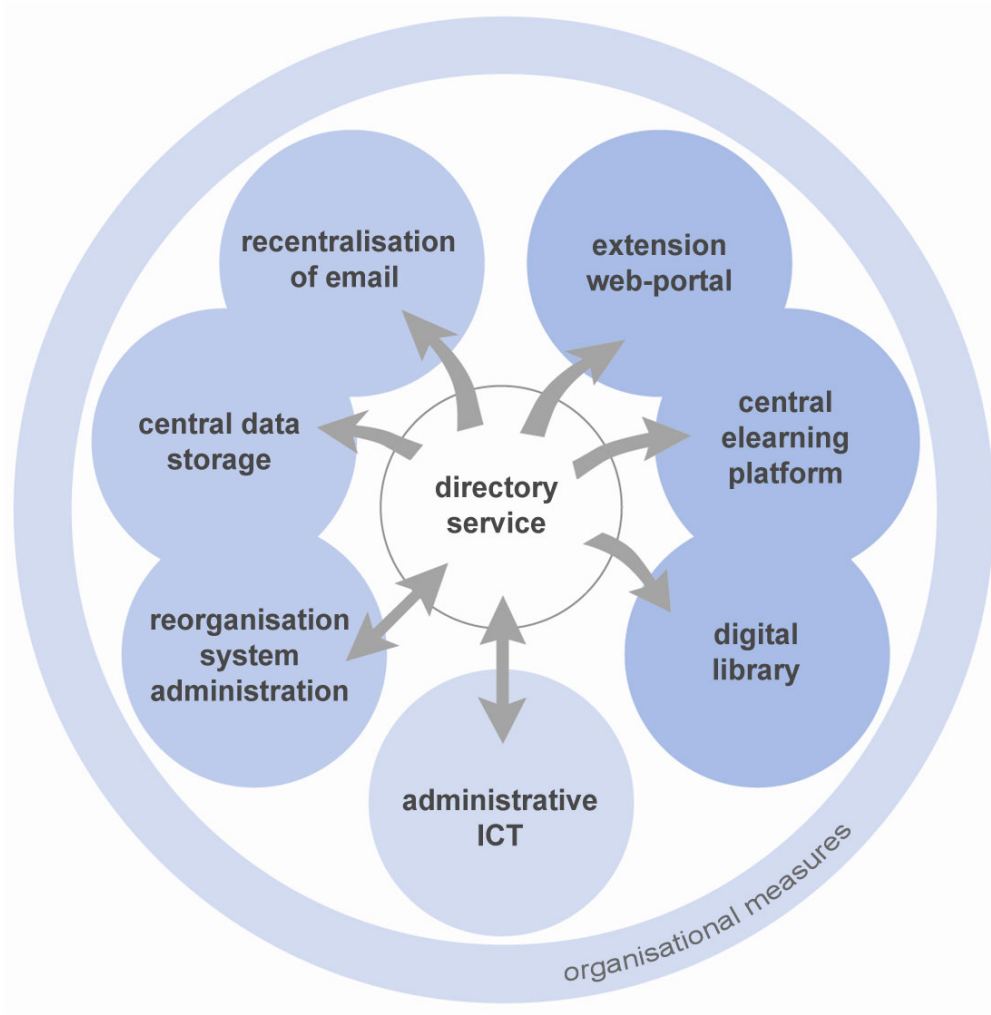
BMBF	Project
TUM	Basic Personal
LRZ	Basic Personal

Since 2007:

Student Tuition

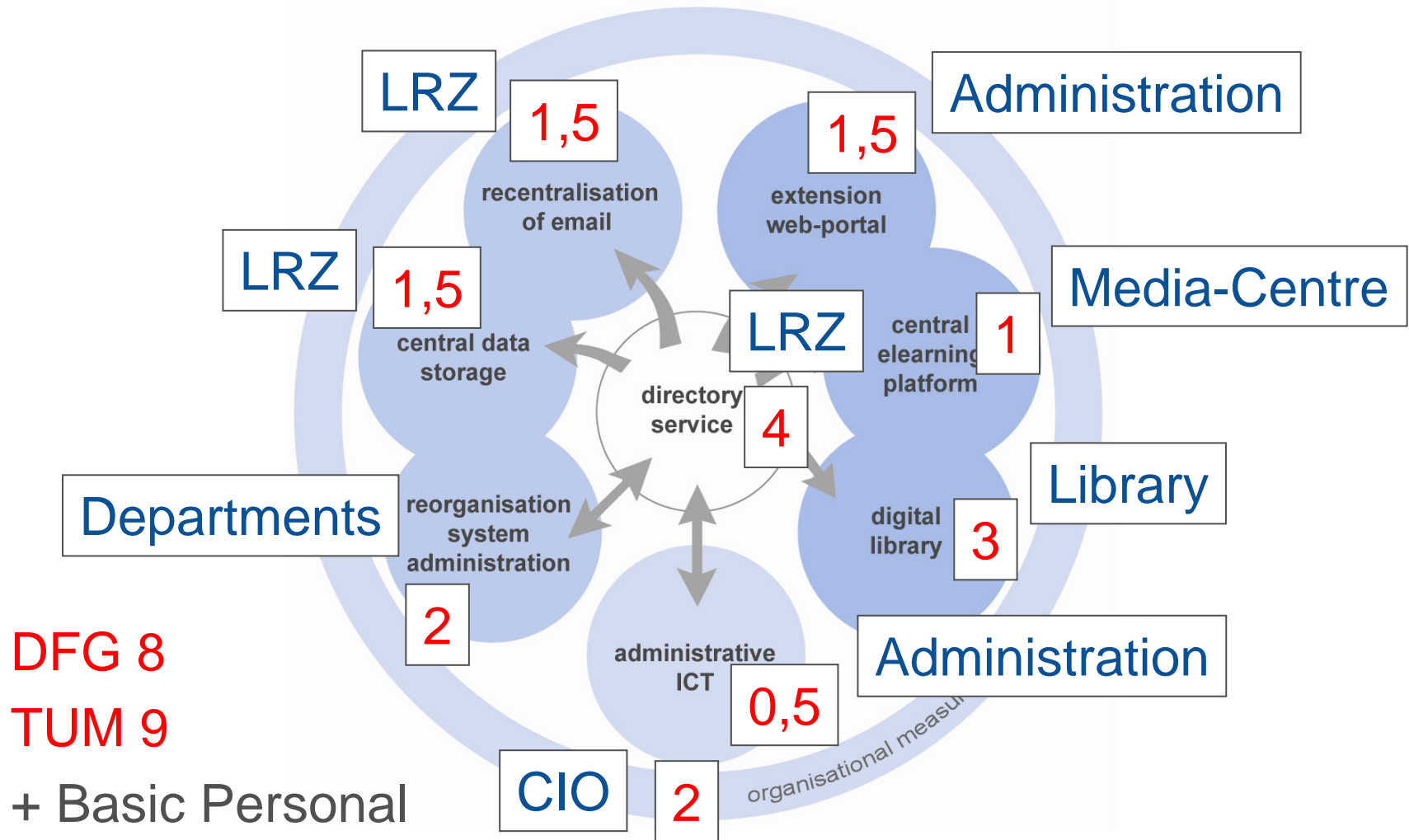


IntegraTUM: Projects





Projects





Organization

Bayerisches Staatsministerium für Wissenschaft, Forschung und Kunst

Executive Board of Management (6)

President, Vice Presidents, Chancellor

Extended Board of Management (20)

Executive Board of Management,
Department Deans, the Speaker for
the Central Scientific Institutes and
the Speaker for the Deans of Studies

Supervisory Board (18)

Senate (10)

External University Council (8)

Deans (12) and Deans of Studies

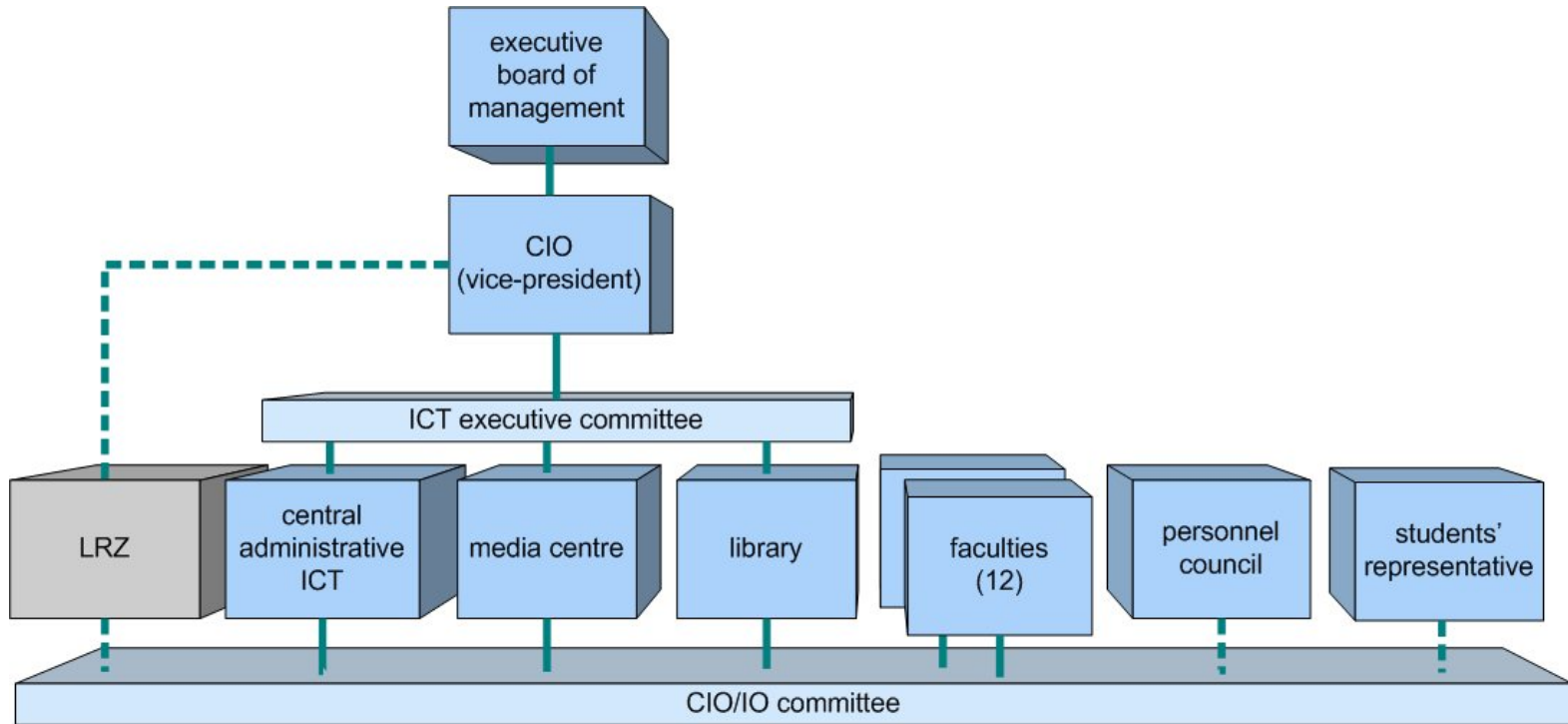
Faculty Board

Departments

Students and Staff



IT-Decision Structures

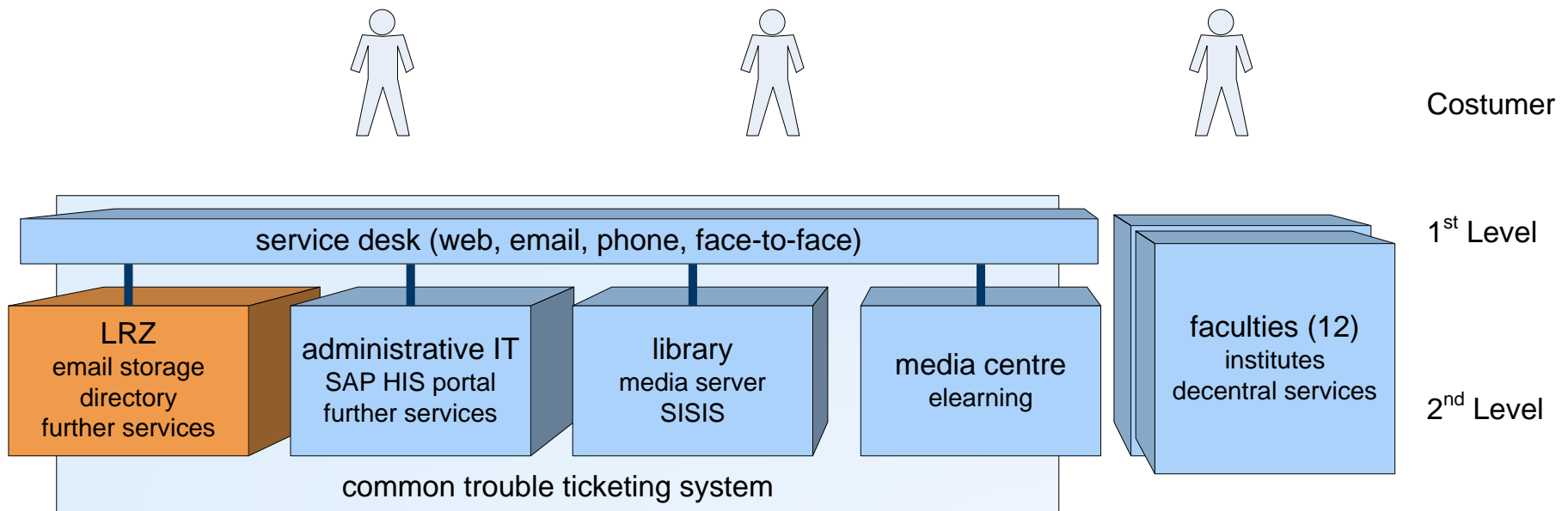


- CIO is member of the board
- CIO/IO represents all parts of the university
- Participation of LRZ



Central IT Service Desk

- Single-Point-of-Contact (staff, students, alumni, guests)
- Contact via: web, email, telephone, personally
- Goal: direct answer or forwarding of all IT-relevant questions





IT Governance, IntegraTUM first summary after 3 years:

- Outsourcing of IT services to LRZ successful
- University needs at least minimal IT-infrastructure, competence
- Incentives better than Top-Down imposed rules
- Decision making (small group) and information dissemination (large group)



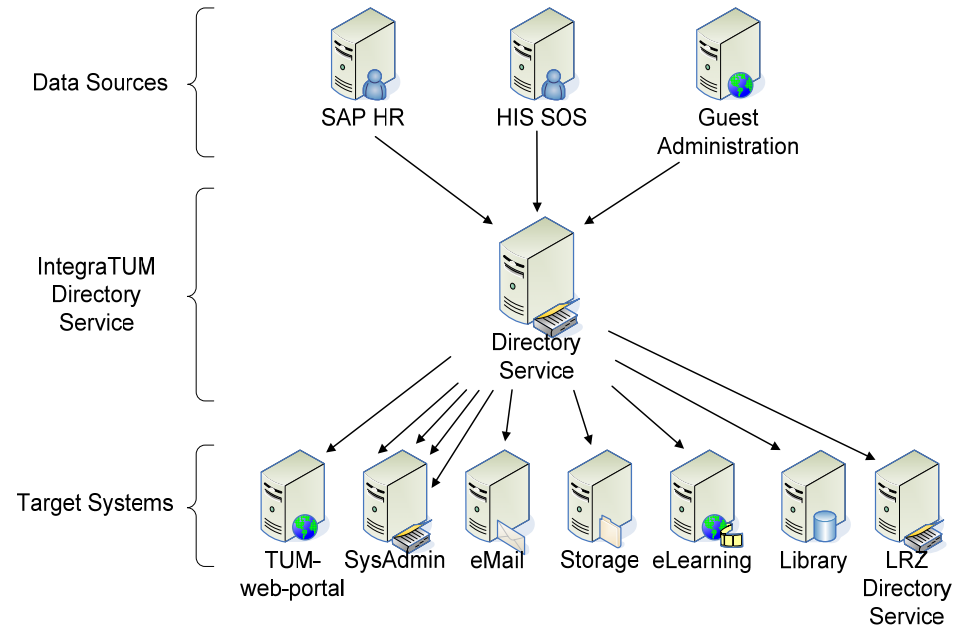
Identity Management

■ Provision of a single

- central,
- always up-to-date,
- mandatory

Data set

(staff, students, guests)



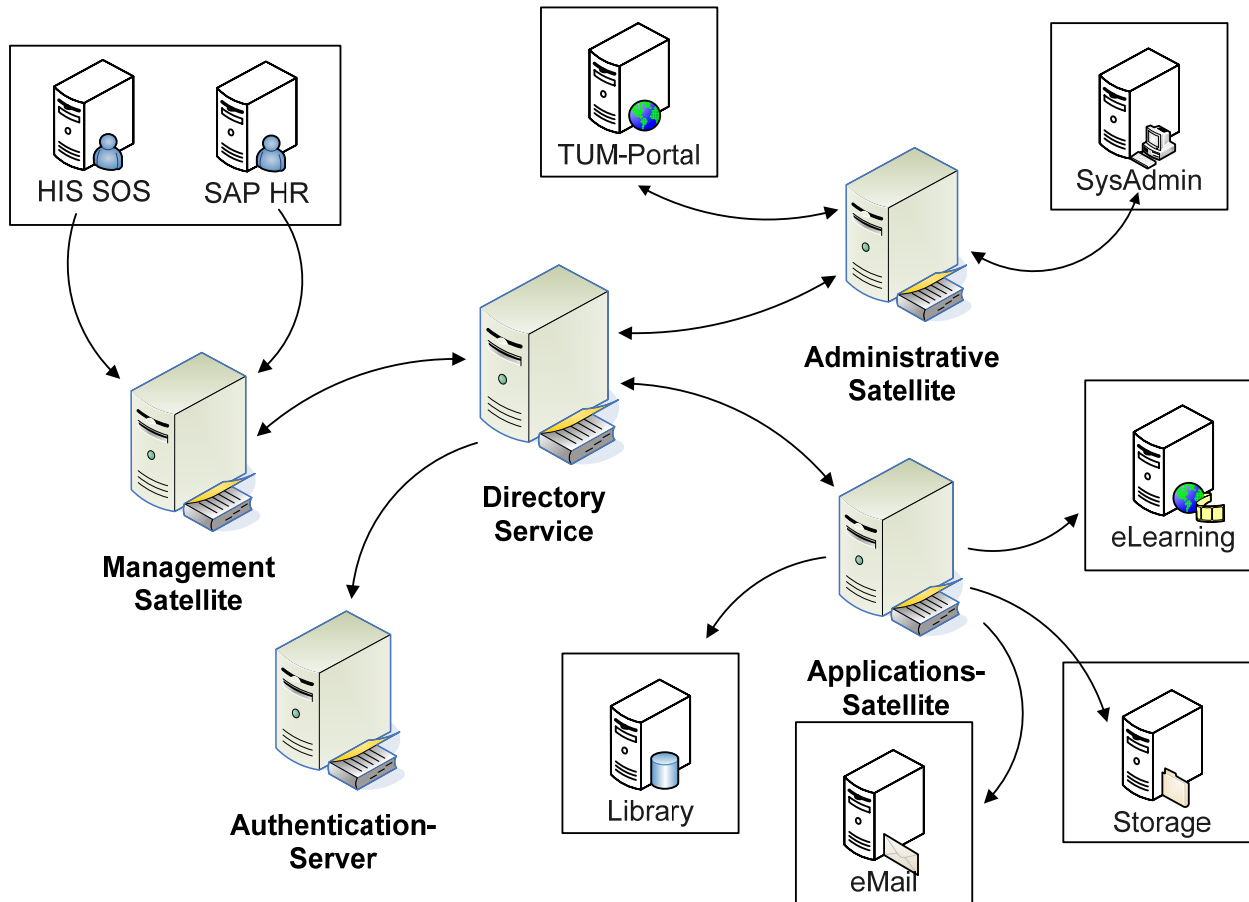
■ Provisioning of non- LDAP-compliant services:

- Input by proprietary interfaces
- Automatic service-specific user administration

■ University processes supported by Workflows



Identity Management: Realization

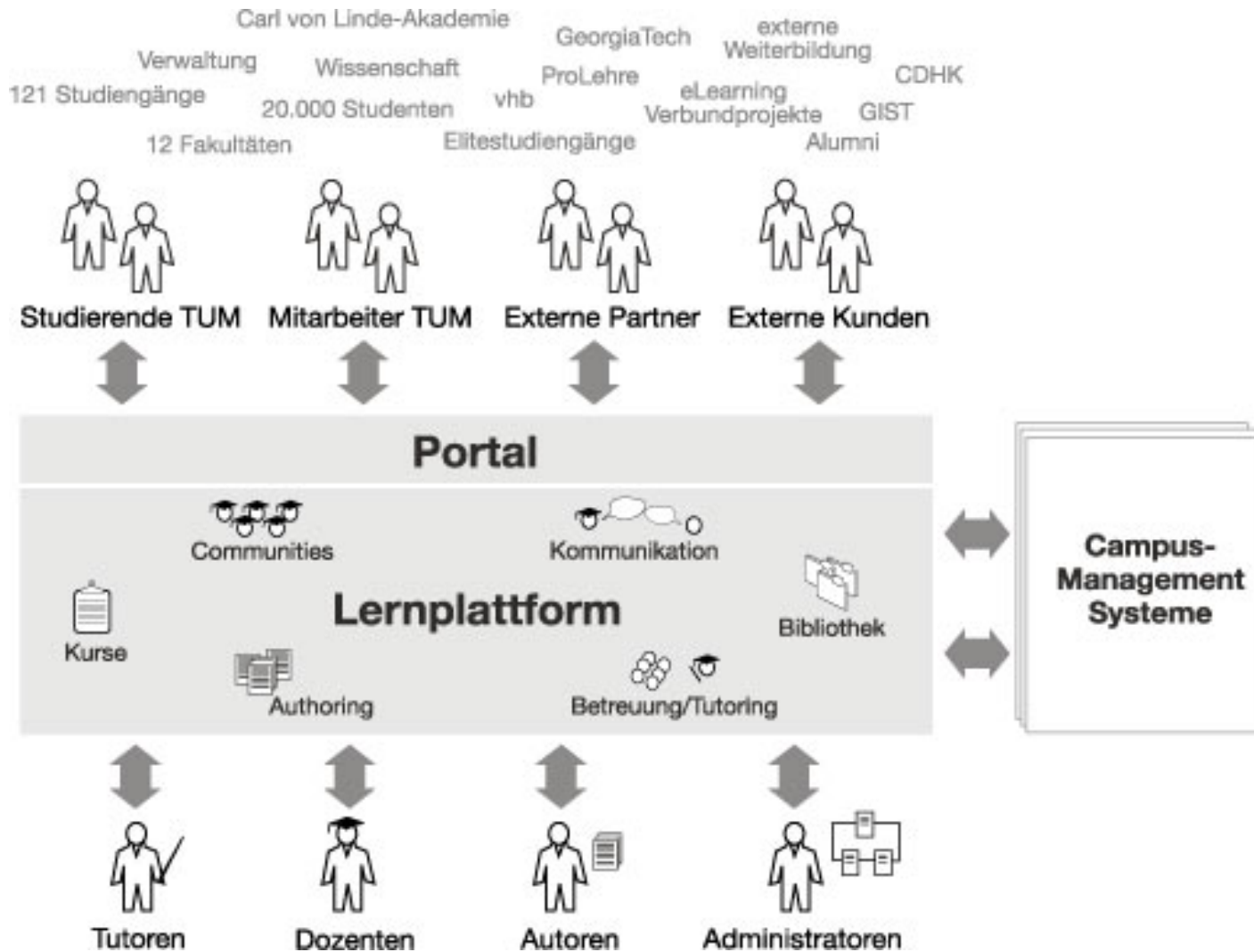


- Flexibility and Extensibility
- Ease of Change Management through Decoupling
- Transparency through well defined dataflow
- Integration of security concept



eLearning (elecTUM)

- General Concept is blended learning
- Support of a central TUM-eLearning-platform – CLIX Campus, imc with heterogeneous uses
- WS 06/07: 10.000 Users, SS 07: 180 Courses
- Integration into IT-Infrastructure (Connection to Campus Management Systems)
- Uses: Primary Education, further education, international cooperations, EMBA, ...





Extension of digital library services

- Central document – and publication server
 - Support for the publication of digital documents
 - Support of multimedia in research and teaching
- One single system for all object types – modular system architecture
 - Books, articles, international reports
 - Thesis (Diploma, Master, PhD, Hab.)
 - Collection of pictures, videos, films
- Central service for technical support
- Decentralized responsibility for content and organization (library, corporate communication, ...)



Central Management for ECTS and examinations: HIS@TUM

- Goal: better efficiency and QoS for examination management under the Bologna-conditions

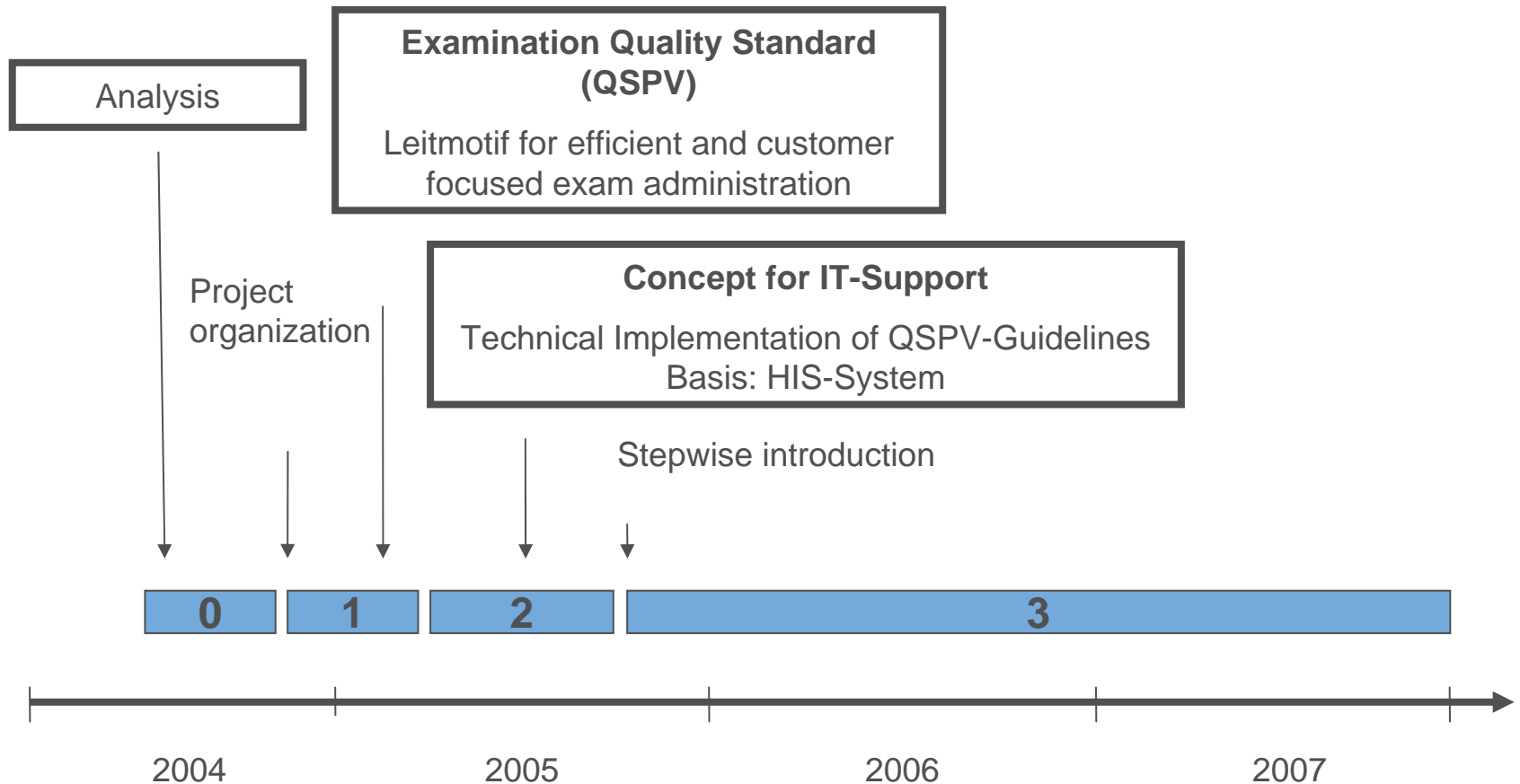
- Process- and customer-oriented approach

- Methodology
 - Analysis of Structures and Processes
 - Development of a system-independent concept „The Quality Standard“
 - Stepwise realization over 3 years

- HIS-Modules POS and QIS



HIS@TUM - Timetable





Summary

- Quality of a modern university depends directly from quality of its IT-strategy

- Important factors for success:
 - Optimization of processes
 - Organization
 - Technical solutions
 - Change Management
 - Marketing
 - Support

- Since 2001: new IT structures at TUM