IT Service Management at the Leibniz Supercomputing Centre

People,
Process,
Technology

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Leibniz Supercomputing Centre of the Bavarian Academy of Sciences and Humanities

The Leibniz Supercomputing Centre (LRZ)

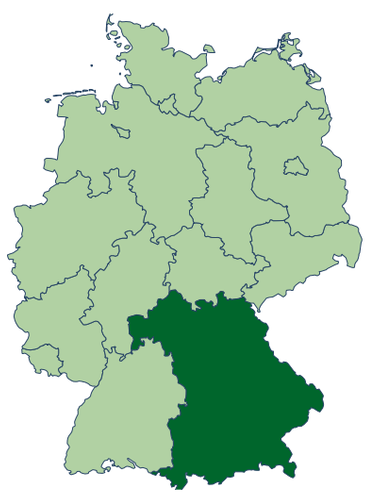
Who we are, what we do

Leibniz Supercomputing Centre (LRZ)

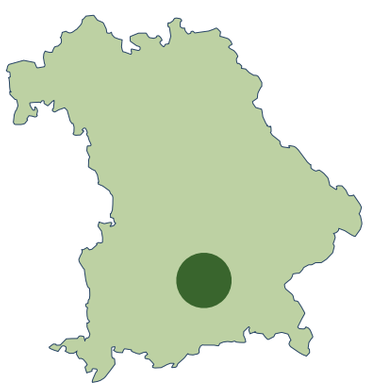
- Owned by the Bavarian Academy of Sciences and Humanities
- Staff: ca. 170 full time employees
- The LRZ operates
  >10 routers; >1.000 switches; >2.000 access points; >80 dark fibres; >600 physical servers; a VMware ESX cluster with 512 cores; a supercomputer (2012:>100.000 cores); a Linux cluster with >5.000 cores; a virtual reality laboratory; archiving systems with >42 petabyte capacity; etc.

LRZ: Mission ("Business")

- National and European Supercomputing Centre
  - Part of the Gauss Centre for Supercomputing
  - Integrated in National and European HPC and Grid projects



- Regional Computer Centre for all Bavarian Universities
  - Capacity computing, special equipment, Backup and Archiving Centre (15 petabyte, more than 9 billion files)
  - Competence centre (Networks, HPC, Grid Computing, IT Management)



- Computer Centre for all Munich Universities
  - Student users: more than 90,000
  - Professional users: more than 30,000; including 8,500 scientists

A process-oriented management system

Why we need it, what it is

Why we need (better) Service Management

Our customers' situation

- LRZ services become more 'business' critical
  - Changes in syllabi and regulations (e.g. Bologna process) result in higher administrative workload Administrative processes increasingly automated and IT-dependent
  - (Semi-)commercial application services by university institutions and spin-offs use LRZ sub-services.

⇩

- Customers have higher demands
  - LRZ services need to have a high availability
  - If something goes wrong, support needs reliable support

Challenges for the LRZ

- Scope, volume and complexity of service provisioning increases
- Customers' #1 demands are **availability** and **dependability**

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- **Goal:** Stable services with high availability (fewer faults)
- **Goal:** Effective and dependable support (shorter time to restore)

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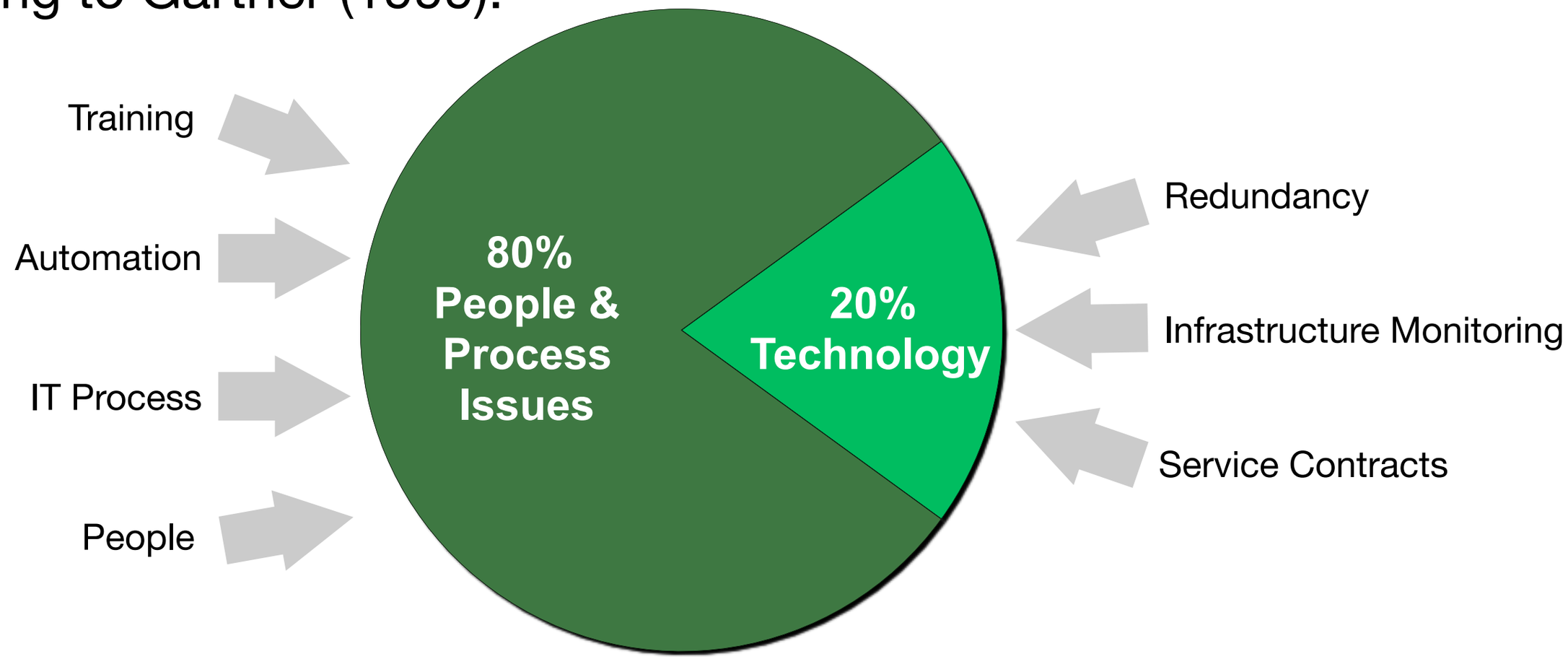
Needed: An effective an efficient system for IT Service Management (ITSM)

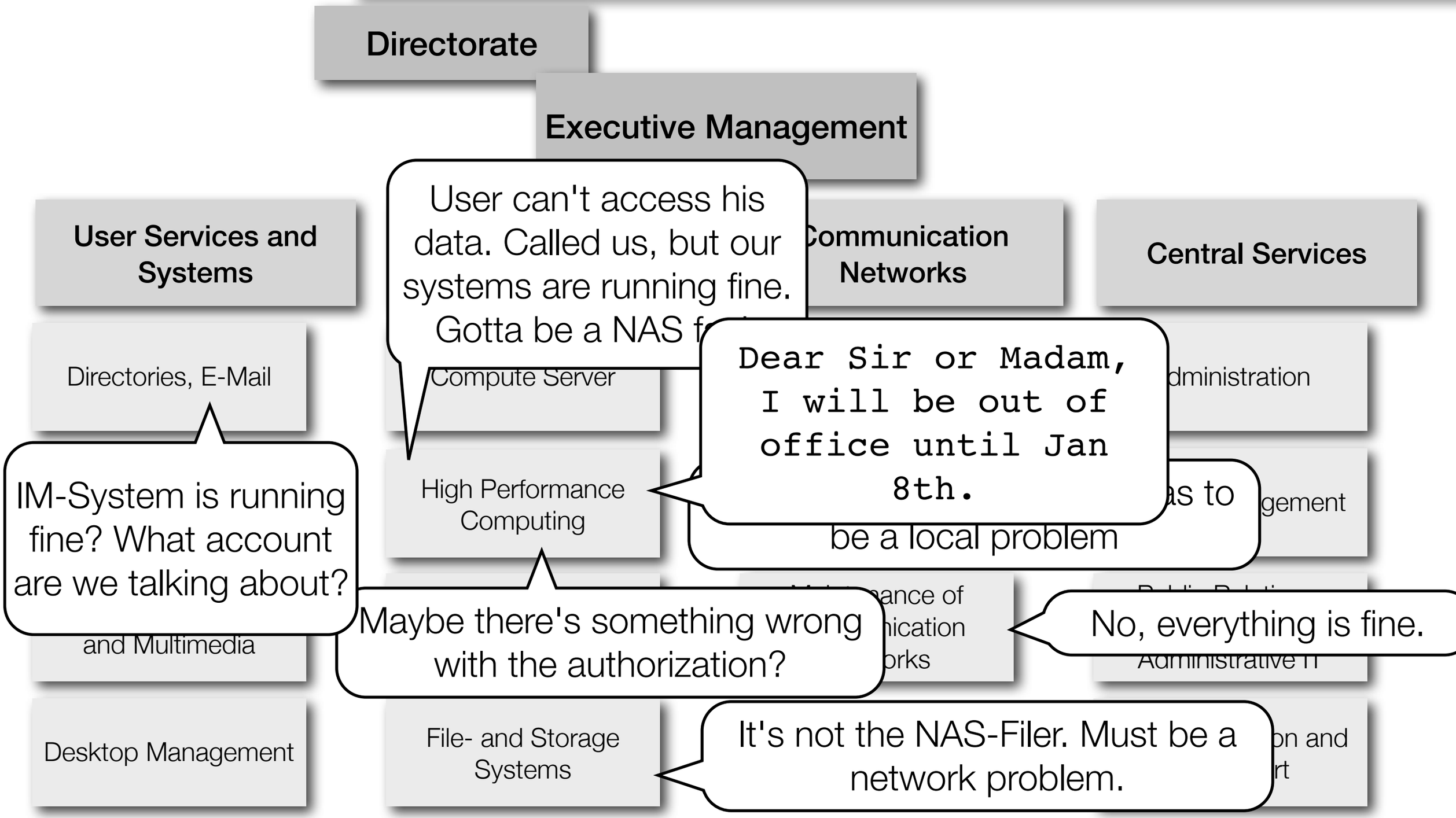
Why do IT services fail?

According to Gartner (1999):



- Technology issues are not the main source for non-availability
- The main source of downtime is "somebody has tinkered with the configuration"

How are failed IT services restored?



Organizational Structure of the LRZ

Process-oriented ITSM system

Goal: Effective and dependable support (shorter time to restore)

⬅ Traditional organizational structures do not adequately support the process of analyzing and repairing faults of complex IT services.

Goal: Stable services with high availability (fewer faults)

⬅ IT services fail most often not because of technological faults, but because of people and process issues.

➡ We need:

- Objectives for change control and incident resolution to be defined, measured and evaluated
- Assignment of roles, responsibilities and authority for the achievement of these objectives
- Systematic processes (workflows) for handling changes and incidents to be defined and enforces

= We need a process-oriented management system

Introducing a process-oriented management system in the real world

Why it's difficult, what aspects need to be considered

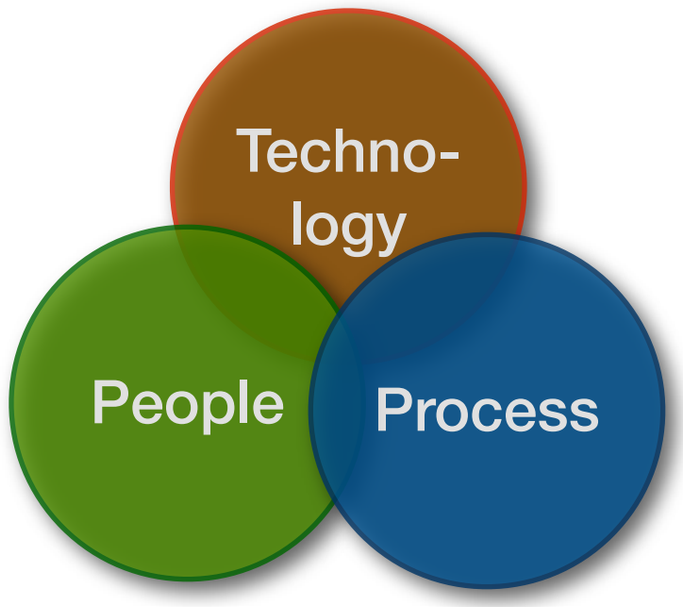
Introducing ITSM is a Technochange

- Introducing IT Service Management is a multi-faceted project
  - Not just an project to build or buy an ITSM software tool
  - Not just a purely organizational change without involvement of technology issues

➡Introducing ITSM is a **Technochange**

  - High risk project, historic failure rate ca. 75%
  - Biggest source of risk: people's negative reactions to changes

- Introducing ITSM with a good chance of success requires an integrated approach considering three overlapping aspects:
  - People
  - Process
  - Technology



People, Process, Technology

People

- If staff resistance is high, the ITSM project is doomed.
- A management system needs a certain level of "bureaucracy", and hardly anybody likes more rules, more bosses or change in general.
- No amount of training, motivation and communication is ever too much.

Process

- Without defined process, workflow remains ad-hoc and results won't be repeatable and reliable.
- Process guidance can be "multi-sourced", but for the basic structure of the ITSM system, one established ITSM framework should be chosen
- Processes need to be defined, established, measured and improved.
- Interfaces between the processes are critical for effective management.

Techno-logy

- No tools, no efficiency.
- A good tool can make staff accept organizational change more readily, a bad tool will makes everything worse.
- Tool selection can be a mid-sized project itself.

People

New Roles and Responsibilities

Directorate

Executive Management

User Services and Systems

High Performance Systems

Communication Networks

Central Services

Process Owner - Incident Management → Incident Manager → Incident Owner → Support Team Member

Process Owner - Change Management → Change Manager → Change Owner

Facility Management

Process Owner - Configuration Management → Configuration Manager → Configuration Librarian → CI Owner

Desktop Management

File- and Storage Systems

User Information and IT Support

People

Project Marketing and Training

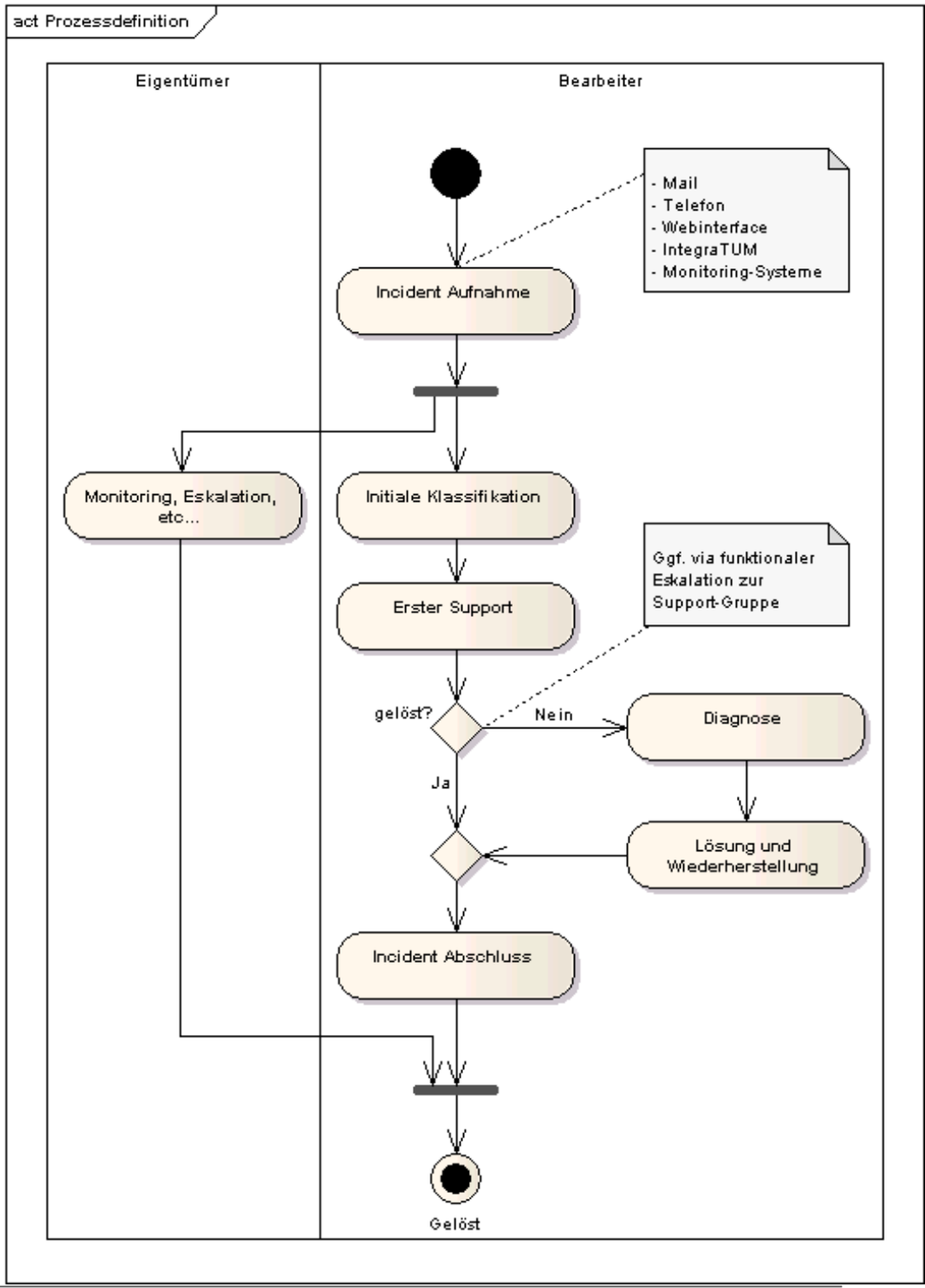
- General Project Marketing (there is never enough communication)
- Training Program
  - All staff eligible to receive in-house foundation training and certification
  - Cooperation with German TÜV Süd (developer of ITSM qualification scheme)
  - More than 150 staff members achieved "ISO/IEC 20000 Foundation" or higher certification since 2007

Participants of the worldwide first pilot exams for new ISO/IEC 20000 personell certification scheme at LRZ, November 2007

Process

Defining Processes

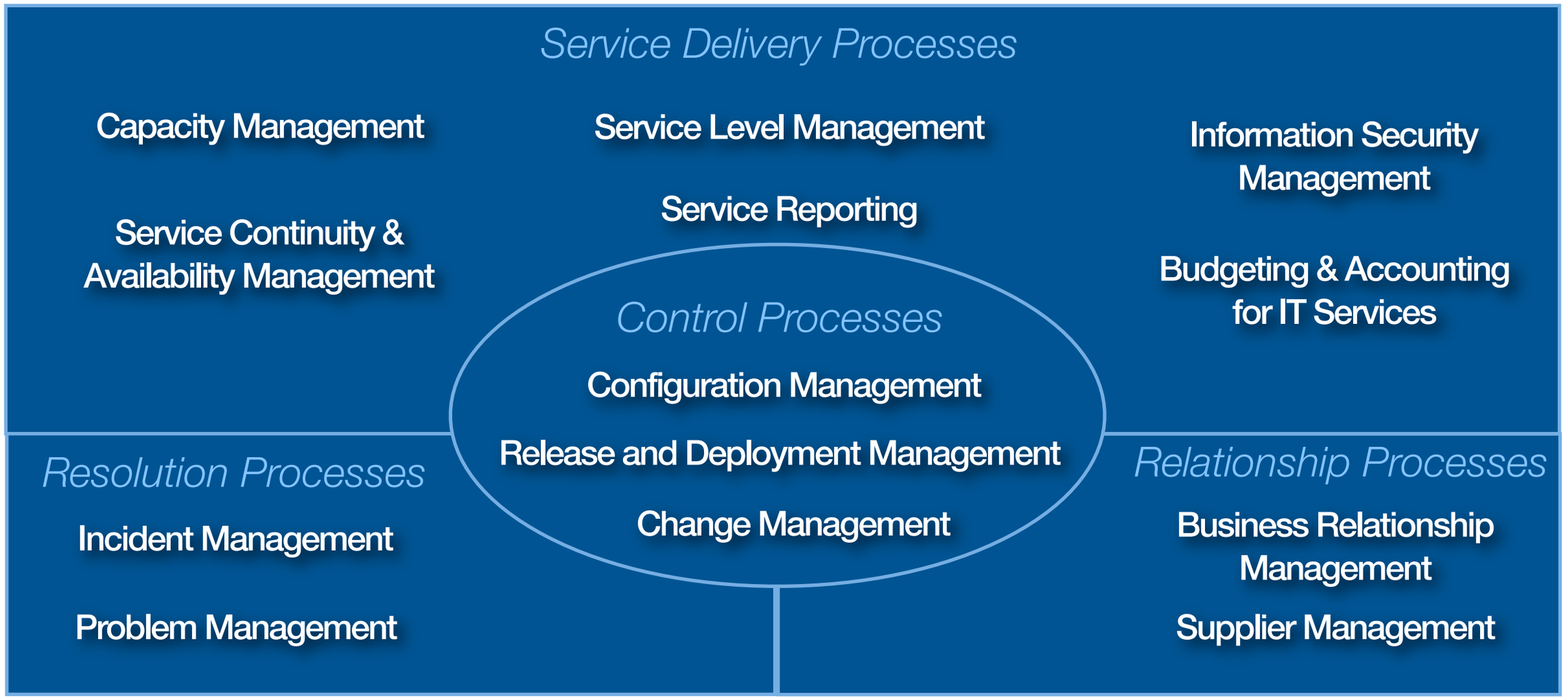
- Prerequisites
  - Process framework (goals and interfaces of each process)
  - Document control
  - Policy and templates for process definitions
- E.g.: Defining LRZ "Incident Management"
  - Objective
  - Workflow: activities, control flow
  - Roles and responsibilities
  - Information to be recorded
  - Tools used
  - Control parameters, "key performance indicators"



Process

ISO/IEC 20000 Process Framework

- Framework with 13 processes, separation of concerns
- Also includes requirements regarding general management practices similar to ISO 9000



Process

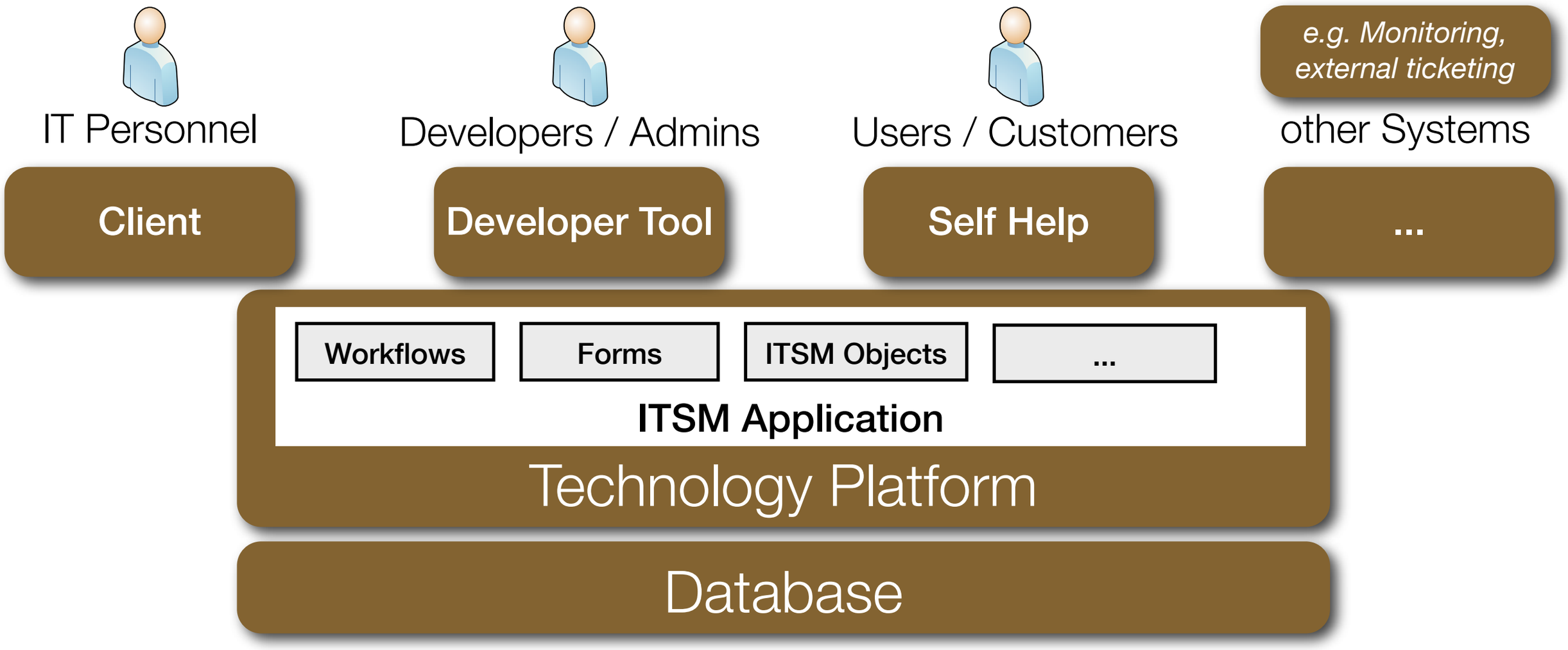
About the ITSM Frameworks

- ITIL V3
  - Most popular ITSM framework, describes ca. 25 processes.
  - 5 books, more than 1500 pages (about 1000 pages net content).
  - Comprehensive, but verbose and badly edited: Abundant contradictions, inconsistencies and obscurities. Could probably be abridged to 250 pages without losing useful content.
- ISO/IEC 20000
  - The "certifiable" standard for ITSM. Defines requirements for 13 processes. About half as popular as ITIL V3.
  - Core parts (20000-1 and 20000-2) less than 100 pages in total.
  - Concise to a fault. Too short to be useful as ITSM guidance by itself.
- MOF
  - Could be called Microsoft's ITIL adaption, describes 16 "Service Management Functions". About half as popular as ISO/IEC 20000.
  - Large number of documents available at microsoft.com/MOF at no cost.
  - Somewhat complex structure, but contains a lot of useful and well-edited content.

Techno-logy

ITSM Suites

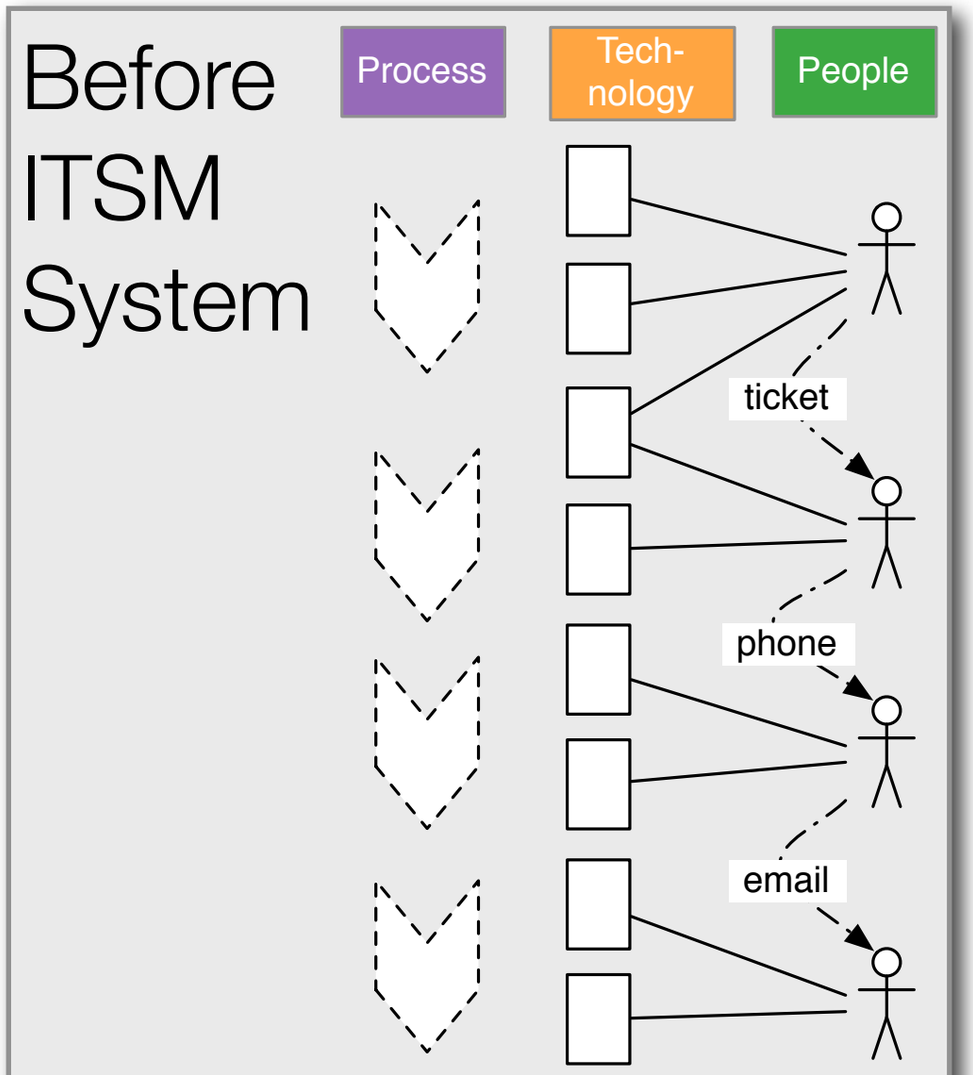
- Over 100 self-proclaimed "ITSM-tools" in a very in-transparent market
- An "ITSM suite" commonly integrates applications for several ITSM processes with each other and with a Configuration Management Database (CMDB)



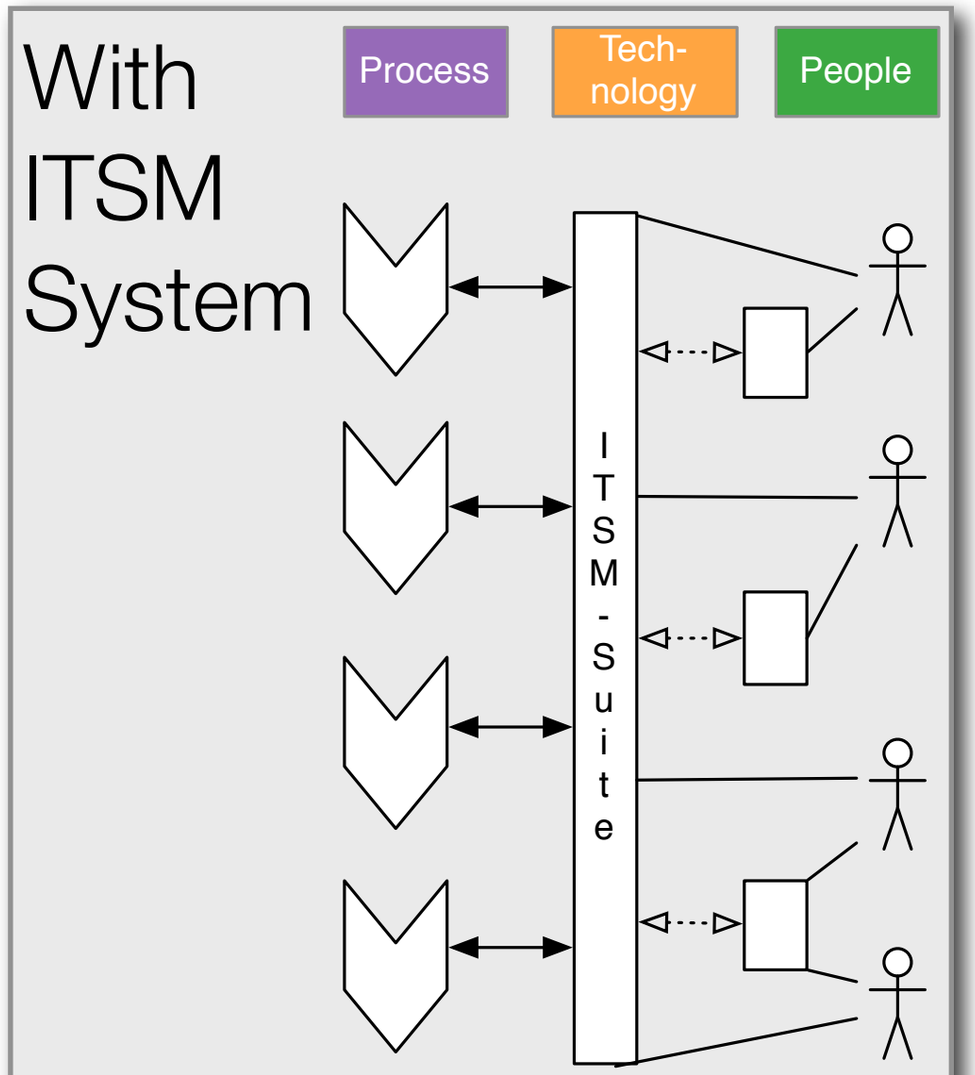
Short tool demo (LRZ-customized iET ITSM 6)

What it looks like

Overall Goal



- Undocumented processes
(maturity level ≤2)
- Many management tools
- Manual workflow control
- Fragmented information flow
- Redundant documentation



- Documented processes
(maturity level ≥3)
- Moderate number of management tools
- Workflow management support
- Controlled information flow
- Definitive documentation databases

Summary and Conclusion

- To provide highly available and reliable services on the basis of complex infrastructures, a systematic and process-oriented approach is indispensable!
- ITSM projects need to be managed as "Technochange" projects.
- ITSM projects are cost- and labor- intensive.
- People and Tool issues are critical success factors!