

SWED-Übungsblatt 2

1. AUFGABE)

Personio is a SaaS company offering HR management software with the following functionalities:

- Employee Management: Employee records, onboarding/offboarding, contract management
- Payroll Management: Payroll processing, tax management, benefits administration
- Recruitment Management: Job postings, candidate management, recruitment workflow automation
- Time and Attendance Management: Attendance tracking, leave requests, vacation management
- Performance Management: Performance reviews, goal setting, feedback mechanisms
- Reporting and Analytics: Employee data analysis, HR KPI reports, customizable reports

Structural Architecture:

1. User Interface:

- o Web Application

2. Application Layer:

- o Employee Management Service
- o Payroll Service
- o Recruitment Service
- o Time and Attendance Service
- o Reporting and Analytics Service

3. Integration Layer:

- o API Gateway
- o Authentication and Authorization Service
- o Notification Service (Email, SMS)

4. Data Layer:

- o Relational Database (e.g., PostgreSQL)
- o NoSQL Database (e.g., MongoDB)

o Data Warehouse (for analytics and reporting)

5. Third-Party Services:

o Tax Calculation Service

o Benefits Management Service o External Job Boards

o Payroll Providers

o Cloud Storage Services (e.g., AWS S3)

6. Infrastructure:

o Cloud Hosting (e.g., AWS, Azure)

o CDN (Content Delivery Network)

o Monitoring and Logging

Architecture Description and Categorization:

- Components: The architecture is composed of modular services that handle different HR functions
- Interfaces: The API Gateway manages communication between the application and third-party services
- Architectural Style: Each HR function is encapsulated in its own service, allowing independent development, deployment, and scaling

2.AUFGABE

Architectural Style:

The paper discusses a Peer-to-Peer (P2P) Architecture, characterized by:

- Decentralization: No central server; each peer acts as both client and server.
- Scalability: As more peers join, the system scales out.
- Fault Tolerance: The system can handle failures of individual peers without affecting the overall network.

Comparison to Other Styles:

- Client-Server Architecture: Centralized with distinct roles for clients and servers, whereas P2P is decentralized
- Microservices Architecture: Composed of loosely coupled services focusing on specific business capabilities, whereas P2P focuses on distributing tasks among peers

- Monolithic Architecture: Single unified codebase, whereas P2P is distributed with each peer handling tasks independently

AUFGABE-3)

Logical View:

- Components: User Interface, Ticket Processing, Payment Processing, Ticket Printing
- Modules: Ticket Selection, Printing Service

Development View:

- Layers: Presentation Layer (UI), Logic Layer (Ticket and Payment Processing), Data Layer (Database for ticketing data)

Process View:

- Processes: User interacts with the UI, system processes ticket request, processes payment, prints ticket, logs transaction

Physical View:

- Deployment: Touchscreen interface, printer, payment terminal

AUFGABE 4)

1. Whistleblowing System on the Internet:

- Recommended Pattern: Anonymous Communication Pattern
- Reason: Ensures user anonymity and data protection, essential for whistleblowing platforms. Utilizes encryption and anonymization techniques.

2. Video Conferencing System:

- Recommended Pattern: Event-Driven Architecture
- Reason: Manages real-time communication efficiently, supports high concurrency, and scales to handle many simultaneous video streams.

3. GPS-Tracker for Cats:

- Recommended Pattern: Microservices Architecture
- Reason: Modular and scalable, notification services, and integration with various devices