

# Internship Content for IT Specialist in Application Development

## Internship Companies

Internship companies should operate in at least one of the following areas and **must be recognized IHK-certified training providers for IT professions**:

- IT Complete Service Providers
- Software Development / Developers
- Service Business Centers
- Workflow Management

**The contents listed are not exhaustive. They serve to provide focus and specification and are implemented based on company and role specifics:**

- IT Security and Data Protection (Identifying, considering, and avoiding threat scenarios and damage potentials. Consulting and offering solutions to clients under these aspects.)
- Developing, introducing, and monitoring strategies for responsible use of digital media (e.g., data protection concepts, personality rights, energy efficiency, environmental concerns).
- Designing and implementing customer-specific, complex software applications, including defining interfaces:
  - Defining program specifications and deriving data models and structures from professional requirements.
  - Selecting and applying various programming languages.
  - Analysis, project planning, and implementation.
- Introducing new and modified systems.
- Consulting, supporting, and training clients and users; presenting solutions.
- Testing and documenting applications.
- Utilizing software development tools.
- Developing user-friendly and ergonomic user interfaces.

# Project Work for Final Exam in the Company

For the project work, the candidate must execute a task or a distinct sub-task (timeframe/total scope: 80 hours).

The project is typically carried out in the last few months before the written final exam, following approval of the project proposal.

A company project is defined as **“the largely independent handling of a real customer order (client) by the internship company (contractor).”**

It should **not** be a “fictitious” task exclusively developed for the exam, nor a research paper explaining IT functionalities—these are likely to result in rejection by the examination board.

The participant’s operational field must be evident from the project assignment. For sub-projects, interfaces for integration into the overall project must be highlighted. The planned **timeframe** must be coherent, and handover points clearly defined.

## Additional Considerations

Regardless of the programming project’s topic, each project must demonstrate a verifiable benefit, such as:

- Cost savings from the project.
- Time savings in work processes.
- Increased efficiency in workflows.
- Reduction in error-proneness and rework.
- Potential reallocation of tasks previously requiring staff involvement.

If these are challenging to specify due to restricted frameworks (e.g., pre-procured systems or mandatory systems), additional considerations must be provided to showcase technical evaluation competencies.

This can involve presenting and comparing alternative model solutions based on:

- Economic feasibility and scalability.
- Advantages and disadvantages (illustrated in tabular form).

Project methodologies such as **Project Management**, **Quality Management**, and **Software Engineering** receive a special focus and are reflected in the 80-hour timeframe, which is higher than in other IT professions.

# Planning Phase

Before developing a software product, a feasibility study or preliminary investigation must confirm its technical, economic, and staffing feasibility. This phase concludes with a decision on how to proceed.

# Definition Phase

Key tasks include defining product requirements and modeling the solution. Each product must fulfill specific requirements.

# Design Phase

The “large-scale” programming task involves creating a software architecture based on the product’s requirements.

# Implementation Phase

Programming entails implementing specifications for system components, achieving the required functionality via one or more programs (“small-scale programming”).

# Acceptance and Deployment Phase

The finalized software product is accepted and deployed for use during this phase.

# Maintenance Phase

Post-deployment, errors may arise, environmental conditions may change (e.g., new hardware or software), or users may have new requests.

For each phase, the following must be defined:

- Goals of the phase.
- Activities to be conducted.
- Role and activity assignments.
- Deliverables (e.g., documents, products).
- Templates or guidelines.

- Required methods, techniques, and tools.

## Project Content as Per IHK Guidelines

Candidates must analyze customer requirements, plan the project, assess its economic feasibility, develop or adapt a software application, test the application, prepare for its deployment, and document the process according to the requirements.

## Possible Project Ideas for Interns

*(Note: Feasibility must be verified in coordination with the internship company and the regional IHK during proposal submission.)*

### Web Applications

- Programming a CAPTCHA function for a web form.
- Developing a module (e.g., for WordPress, Drupal, Joomla/Typo3).
- Building an online shop system with database integration (MySQL, MS-SQL, PostgreSQL).
- Creating a trouble ticket system for company XYZ.
- Implementing a web-based POS system with touch screen capabilities (e.g., GS1-128, EAN-13).
- Integrating a barcode scanner into a web-based POS system.
- Developing a resource planning tool using a database-driven web application.
- Creating a web interface to manage imports into a proprietary box installation system (e.g., SAP, Microsoft Dynamics integration).
- “Password recovery” feature for new user registrations on a web application.
- Email module development (e.g., SMTP, POP3/IMAP protocols via PHP Framework).
- Web-based timetable creation tool with database integration.
- Inventory tracking through a web application.
- Developing a task-tracking and management system for employees in PHP (complexity required if PHP is the core technology).
- Inventory management app with a user-friendly interface.
- Internet platform for communication and data transfer between agencies and schools.
- Designing a GUI for specific device configurations.
- Developing a complex newsletter tool with categorization options and REST API integration.

### Additional IHK Project Ideas

- Creating an Access database for hardware and warranty management.
- Developing an ergonomic GUI for customer management software.

- Extending a CMS with an image editing feature.
- Building a customer relationship management module for contact grouping and data output.
- Developing a system for recording and planning vacation/working hours.
- Designing a download manager for a specific web browser.
- Cascading context actions (KKA) development.
- Developing a gamified visualization tool for trade fairs.
- Central feedback terminal for time and material management.
- iOS app for emergency doctors to locate and contact colleagues.
- Developing a tablet app for configuring and maintaining a hygiene monitoring system.
- Programming a tool for faster insights into financial disclosures.
- Creating a web-based comparison tool for TV providers.
- Developing plugins for Piwik in Typo3, WordPress, or Drupal.
- Building a personnel management tool for project management purposes.
- CLI tool for processing XML files ("6DS-CLI").
- Java REST client for eDoc-Box server API.
- Wrapper class in C# for an ANSI-C-based protocol stack (SAE J1936).
- Programming an import interface for commission statements in CRM systems.