The cs-techrep Paper Example of a Technical Report in Computer Science or Software Engineering

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Christoph P. Neumann
CyberLytics-Lab at the Department of Electrical Engineering, Media, and Computer Science
Ostbayerische Technische Hochschule Amberg-Weiden
Amberg, Germany

***Abstract*—This paper demonstrates an example of a technical report in computer science or software engineering, based on the `cs-techrep` LaTeX class. The example is intended for beginners, e. g., undergraduate students. It contains a basic outline template and usually fills it with dummy text, but some sections are describing the intent of the outline template and its sections. Graphic exclamation marks highlight important remarks. { ⚠The abstract does neither mention a thesis in which context a technical report is written nor an institution or any other organizational aspects. It is a summary of the content of the technical report, thus, usually the objectives and architecture of a piece of software. Do NOT remove the abstract, this section is mandatory. Do NOT use special characters, symbols, or math in your title or abstract. Do NOT use cites in your abstract.}**

***Index Terms*—template; lorem ipsum.**

I. Introduction and Objectives | Functional Requirements | Problem Statement

The cs-techrep formatting is adopted both from IEEE [1] and IARIA [2] styles. The cs-techrep LaTeX class is based on IEEEtran class [3]. In addition, be aware of the supplementary IARIA editorial rules [4] ⚠ that provide a beginner-friendly set of further advices. It is recommended to use a grammar tool, e. g., the LanguageTool [5] browser plugin in combination with Overleaf [6].

The pipe symbol "|" in the headings represents alternatives. Choose one and remove the others. The selectively provided quoted terms are special German alternatives.

The problem statement needs to be written from perspective of a subject-matter expert ("Fachkonzept"). Like an elevator pitch / mission statement ⚠. NOT from a technical perspective.

II. Optional: Related Work | State of the Art | Methods | Data Acquisition

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III. Architectural Goals

Provides (1) a visualization of the external systems and users with which the system interacts ("Kontextabgrenzung"), (2) the most important technical and organizational preconditions ("Rahmenbedingungen"), (3) quality/non-functional requirements ("Qualitätsziele"), and/or (4) architectural style design decisions with formative patterns of the solution ("Architekturstil") as well as (5) the applied programming language.

IV. Architecture of FancyName | Results | Structural Design | "Bausteinsicht"

A. Technology Stack | Overall System

Provides (1) design decisions based on the previously defined requirements and (2) a visualization of the functional structure at top level including relationships ("Grobe Zerlegung"), thus, gives an overview on modules, frameworks, and middleware.

In discussions of multi-tier architecture, layer is often used interchangeably – and mistakenly – for tier. They aren't the same. A "layer" refers to a functional division of the software, but a "tier" refers to a functional division of the software that runs on infrastructure separate from the other divisions. The Contacts app on your phone, for example, is a three-layer application, but a single-tier application, because all three layers run on your phone.

In discussions concerning multi-tier architecture, the term "layer" is frequently misused interchangeably with "tier", despite their distinct meanings. A layer denotes a functional partition within the software, whereas a tier signifies a functional division that operates on separate infrastructure from other divisions/tiers. For instance, the Camera app or Settings app on your phone exemplifies a three-layer application but remains a single-tier application since all three layers run on your phone.

B. Presentation Tier | Frontend

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C. Application Tier | Backend | *"Anwendungskern"*

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D. Data Tier | Persistence

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E. Optional: Infrastructure and Deployment | Distribution Perspective | *"Verteilungssicht"*

Provides (1) information about configuration, exact software versions, SBOM, DevOps, Cloud, AWS, and others. Should add (2) security-related considerations or disclaimers. Could include (3) a software bill of materials (SBOM), at least for the major libraries or frameworks.

V. Discussion | Evaluation | Lessons Learned | Impediments

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VI. Conclusion and Future Work | "Fazit und Ausblick"

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{ ⚠ You must not leave the bibliography blank. Add appropriate references to your related work.}

References

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