CatchyName: A MEVN-based Cloud Application for Incidence Figures and Vaccination Progress

Technical Report: CL-TR-2024-42, March 2024

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***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.**

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

{ ⚠ 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. Beginners should consider comparing their self-written abstract with the result of a generative AI that summarizes your content after you have written a nearly stable draft version. However, do not use a verbatim copy to replace your abstract, just use generative AI for inspirational purposes. Do NOT use special characters, symbols, or math in your title or abstract. Do NOT use references in the abstract, avoid abbreviations or acronyms. The abstract must look as one paragraph only. Ideally, end the abstract with one sentence stressing out the main output of the paper.}

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 title of your paper should not exceed two lines ⚠. In exceptional cases, three lines might be allowed. A four-line-title is absolutely forbidden (hint: use the longer form in the abstract).

For capitalization of titles and section headings, use a web tool like Capitalize My Title ⚠ with the option `Chicago` for capitalization rules by Chicago Manual of Style (CMOS).

Some TODO

The cs-techrep allows for a TODO command that lets the user mark things to do later, in a simple and visually appealing way.

The pipe symbol "|" in the section headings represents alternatives! Choose one and remove the others ⚠. The selectively provided quoted terms are special German alternatives. You may deviate from the structure of this example document and its exemplary section headings.

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

{ ⚠ End the first section with a paragraph describing the structure of the paper.}

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"), cf. Table I, and/or (4) architectural style design decisions with formative patterns of the solution ("Architekturstil") as well as (5) the applied programming language(s).

IV. Architecture of CatchyName | 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.

Please cite as: Vorname1 Nachname1, Vorname2 Nachname2, Vorname3 Nachname3, Vorname4 Nachname4, Vorname5 Nachname5, Vorname6 Nachname6, and Christoph P. Neumann. *CatchyName: A MEVN-based Cloud Application for Incidence Figures and Vaccination Progress*. Technical Report CL-TR-2024-42. Ostbayerische Technische Hochschule Amberg-Weiden, CyberLytics-Lab at the Department of Electrical Engineering, Media, and Computer Science, Mar. 2024.

Table I. QUALITY/NON-FUNCTIONAL REQUIREMENTS ("QUALITÄTSZIELE")

Quality Req.	Description
Usability	Intuitive operation and easy to learn
Security	Content is protected against unauthorised access
Maintainability	Easy expandability and modification
Easy to operate	The application can be used without major adjustments be used

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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{ ⚠ Beginners' guide against **kindergarten mistakes**: Expand each acronym only when first used; then use only the acronym (however, do not take the abstract into account of this rule). Insert at least a sentence between a section title and subsection title! In-text references (i.e., "text [x][y]…"), leave a space between "text" and "[x]"! Prefer references to footnotes. Explain abbreviations in the paper text. All "section x", "figure x", "table x" must be "Section x", "Figure x", "Table x" (i.e.,

capital letter)! Across the entire paper; always e.g., and i.e., are followed by a comma ","! Across the entire paper; "which" is preceeded by a comma "," or replace a which-without-a-preceeding-comma with "that". Check your raster images for appropriate quality!}

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

A selection of previous technical reports of the CyberLytics lab [7–34] is included as reference and further example.

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