Photo by Raychan on Unsplash

INNOQ Technology Day / online / 13. November 2023

Architecture Communication Canvas

Low(est) effort architecture documentation

GERNOT STARKE
@GERNOTSTARKE@INNOQ.SOCIAL

INNOQ

BENJAMIN WOLF
@BEN@INNOQ.SOCIAL

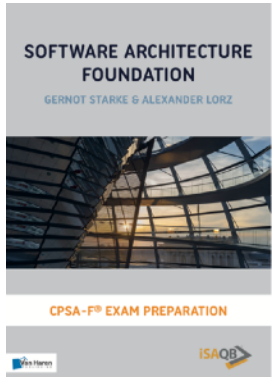
„Es ist nicht zu wenig Zeit, die wir haben, sondern zu viel Zeit, die wir nicht nutzen.“

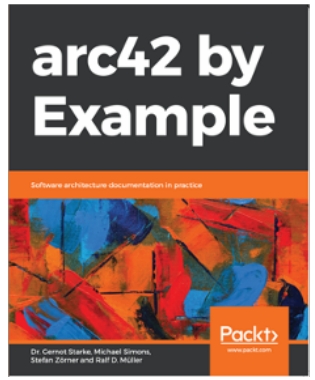
Seneca

Gernot Starke

Fellow
at INNOQ

Co-founder and maintainer of arc42
Co-founder of aim42
Co-founder of iSAQB





„You can solve any problem with good coffee."

Benjamin Wolf

Senior Consultant / Coffee Consultant at INNOQ

Consultant for architecture development / documentation
Trainer for iSAQB Foundation, IMPROVE and ADOC
arc42 practitioner and maintainer
Coffee connoisseur

Why this topic?

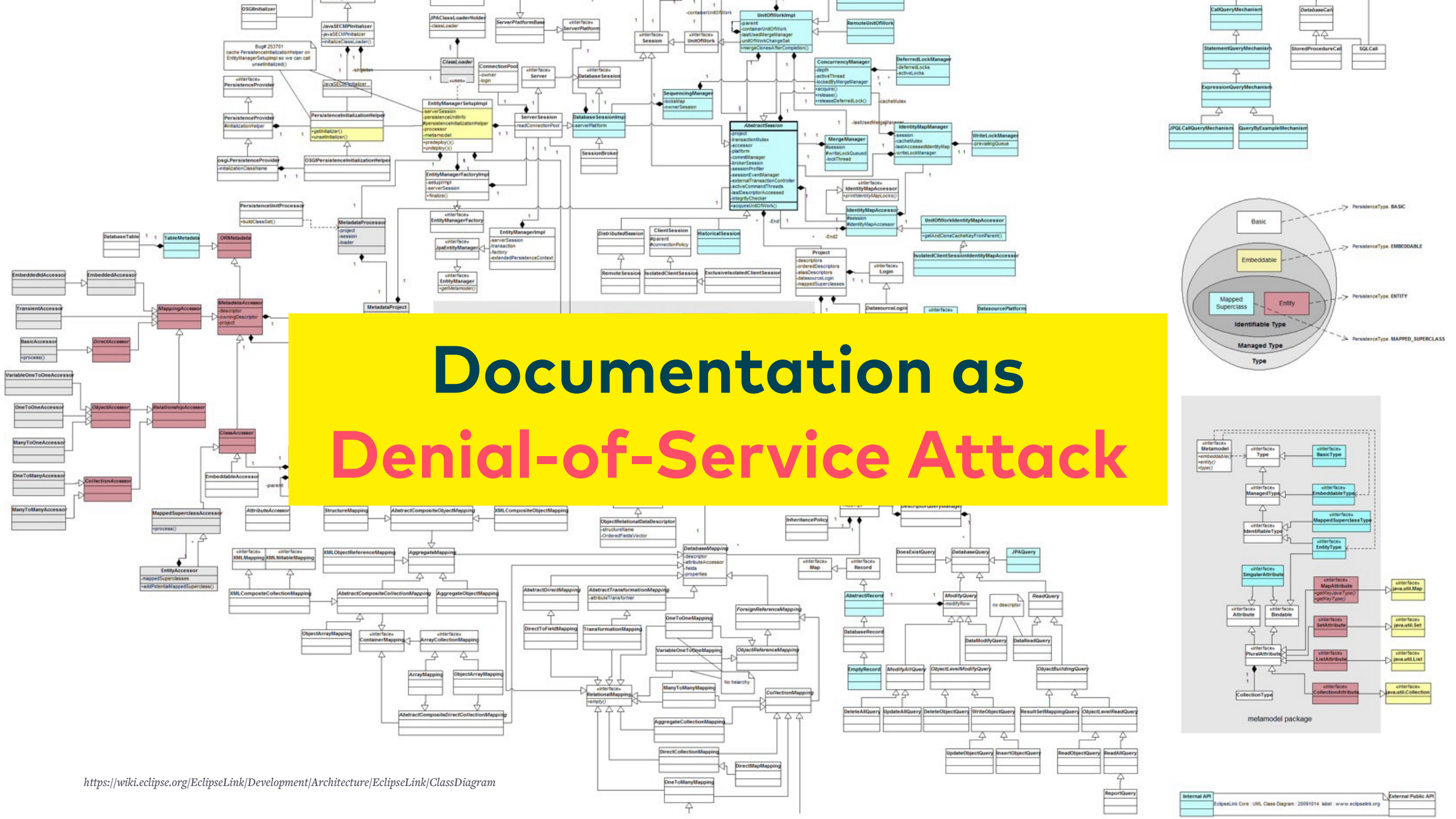
The Endless Void ...

Photo by Rubén Bagüés on Unsplash

Nobody Finds a Thing

image by DALL.E

Documentation as Denial-of-Service Attack



https://wiki.eclipse.org/EclipseLink/Development/Architecture/EclipseLink/ClassDiagram

Assumption

You

- need* to document
- have limited time

* if we were younger and naive, we would have written „want“

Agenda

ACC

architecture communication canvas

arc42 in a nutshell

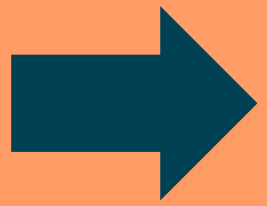
What is a Canvas?

Agenda

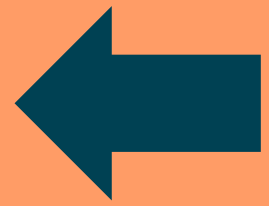
ACC

architecture communication canvas

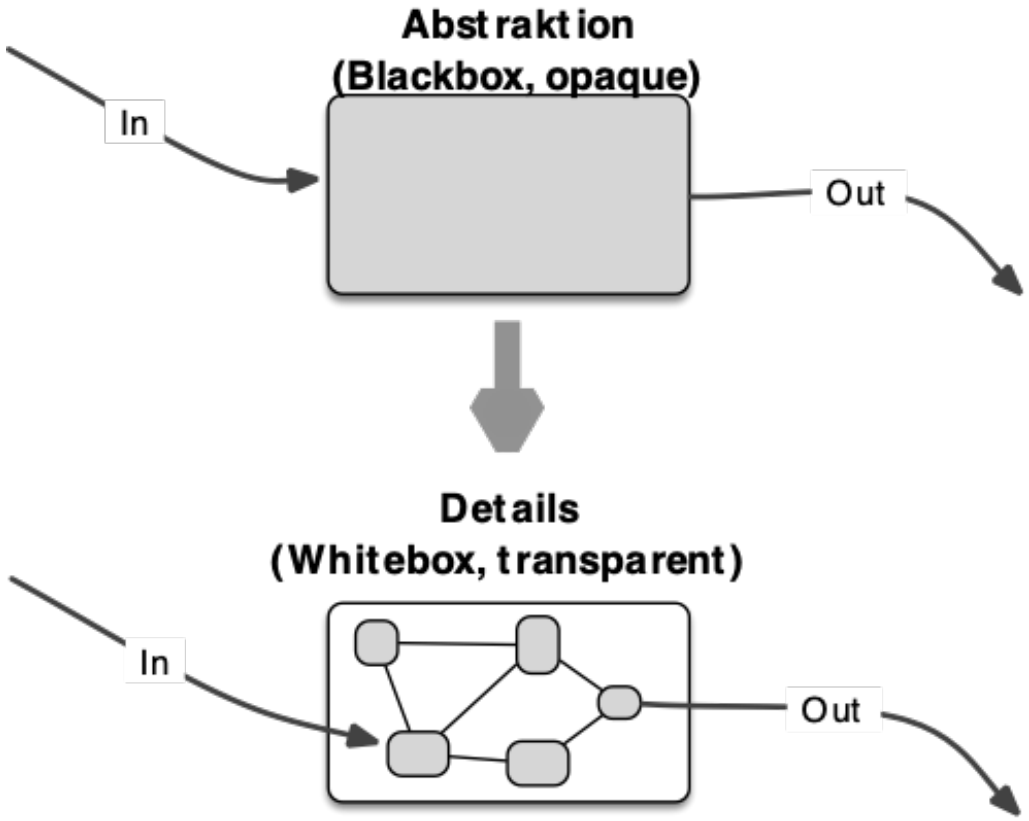
arc42 in a nutshell



What is a Canvas?



Abstraction is your best friend!



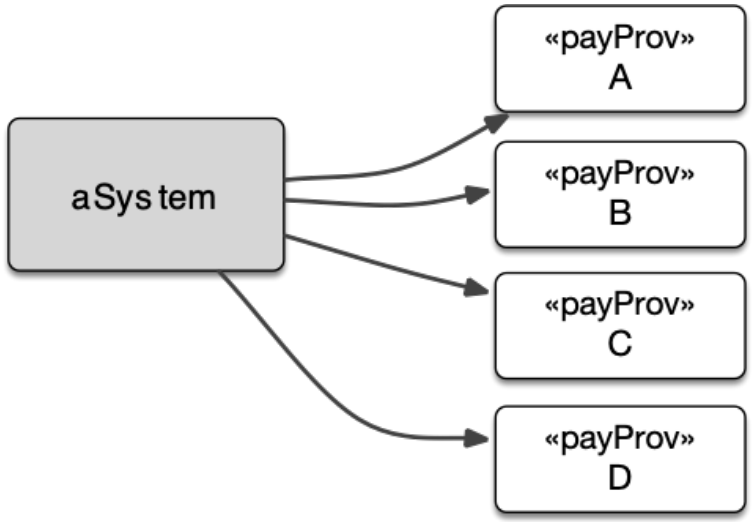
very sparse

less sparse!

Courage to leave things out* (1)

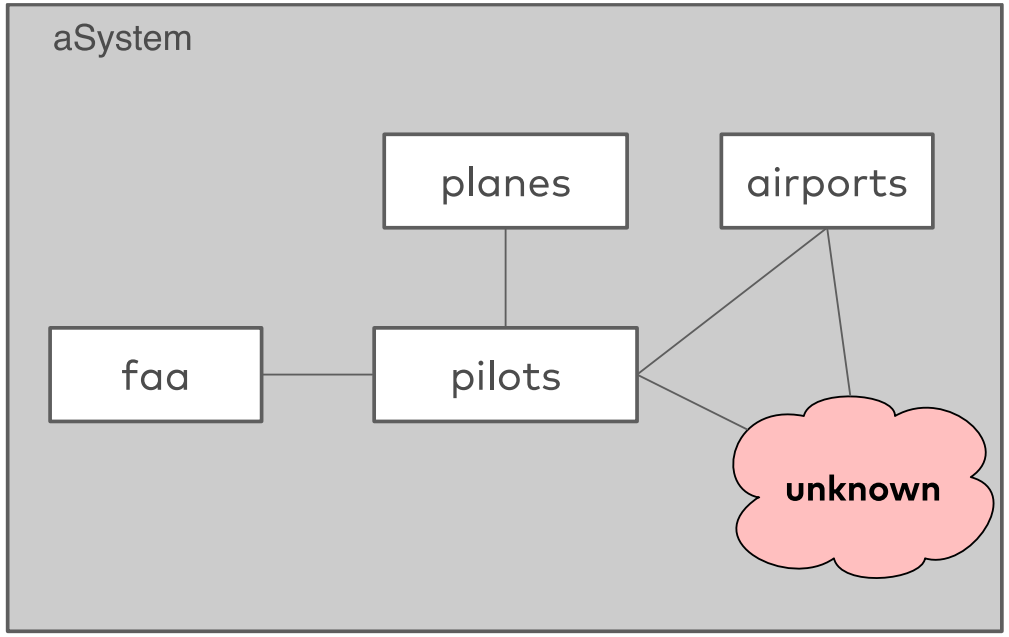
Element	Description
PayProv	All our payment providers A-D

sparse



less sparse!

Courage to leave things out* (2)



sparse

some more details

other funky stuff

Use the Canvas

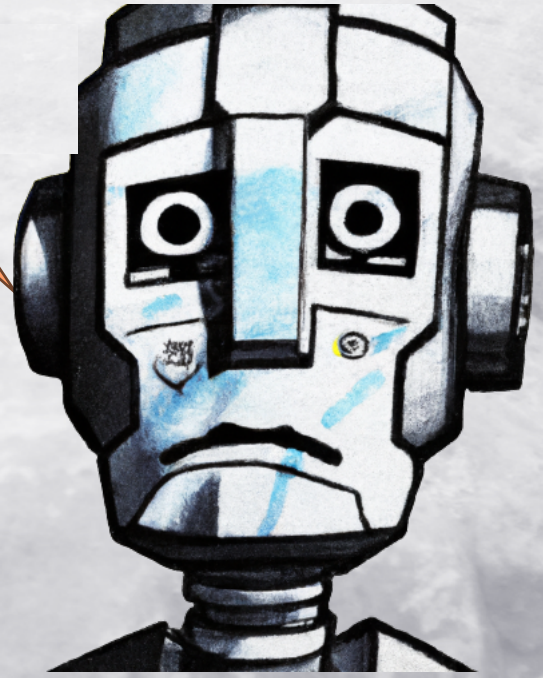


Photo by Kari Shea on Unsplash

Can-what?

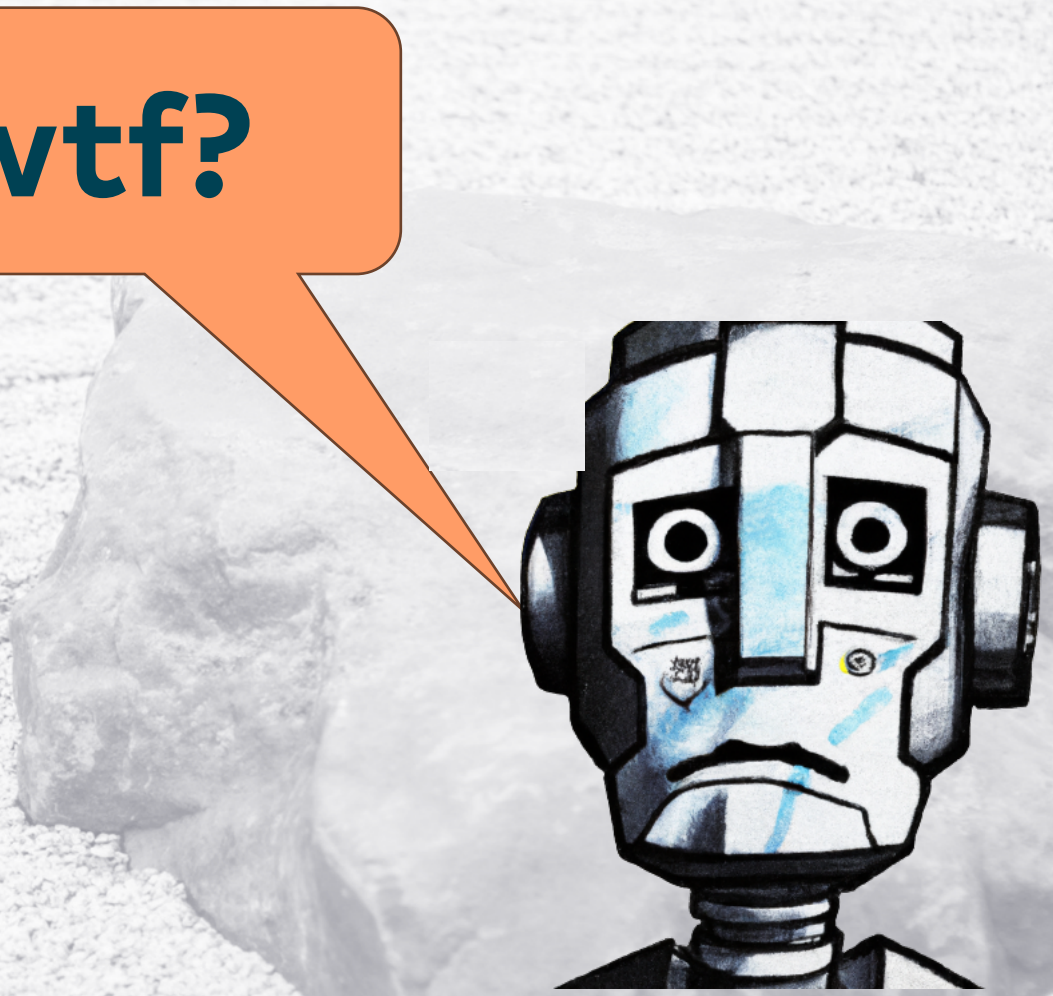


Photo by Kari Shea on Unsplash

Canvas (1)

explained by chatGPT

In software engineering, a canvas typically refers to a visual container where users can interact and manipulate elements to create or modify content.

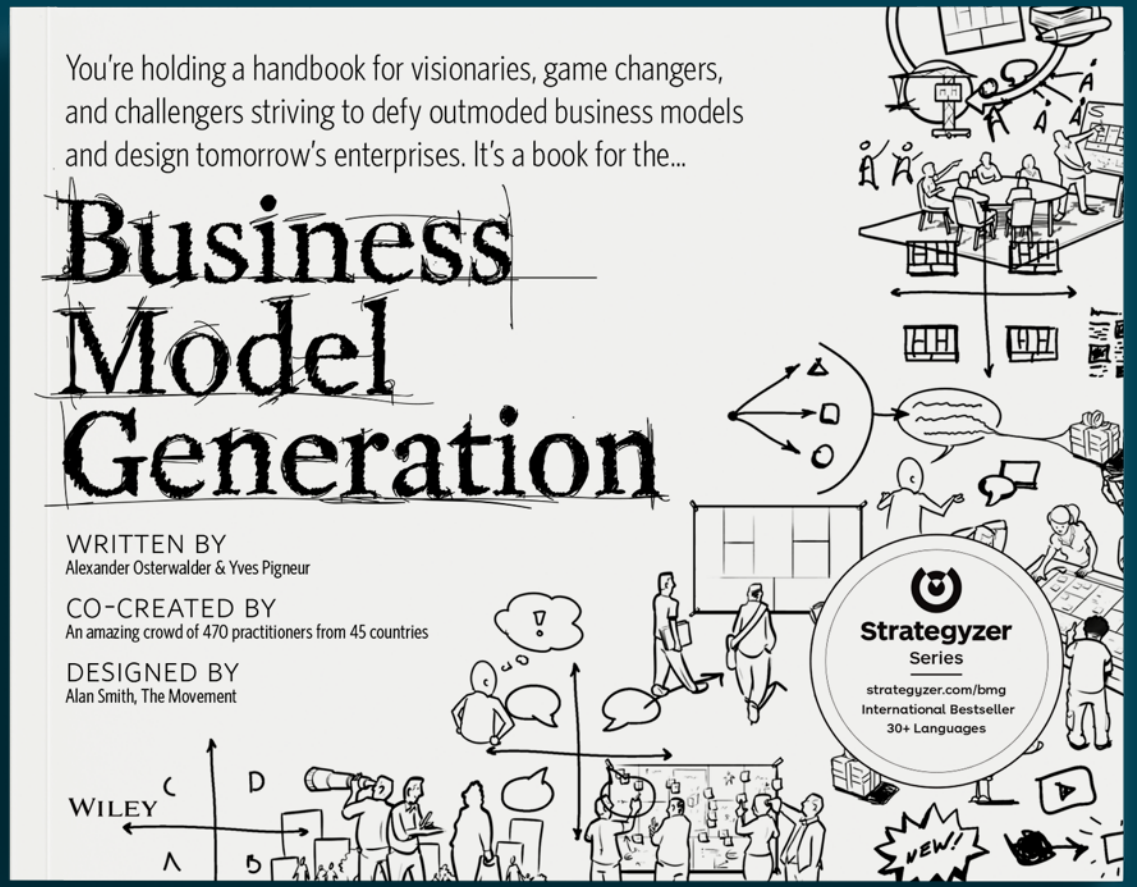
https://chat.openai.com/share/ce9455a9-4d17-4e32-a590-a53136ea481a

Canvas (2)

explained by us

... A canvas is a structured visualization that facilitates understanding and analysis of key elements of specific topics..

Business Model Canvas

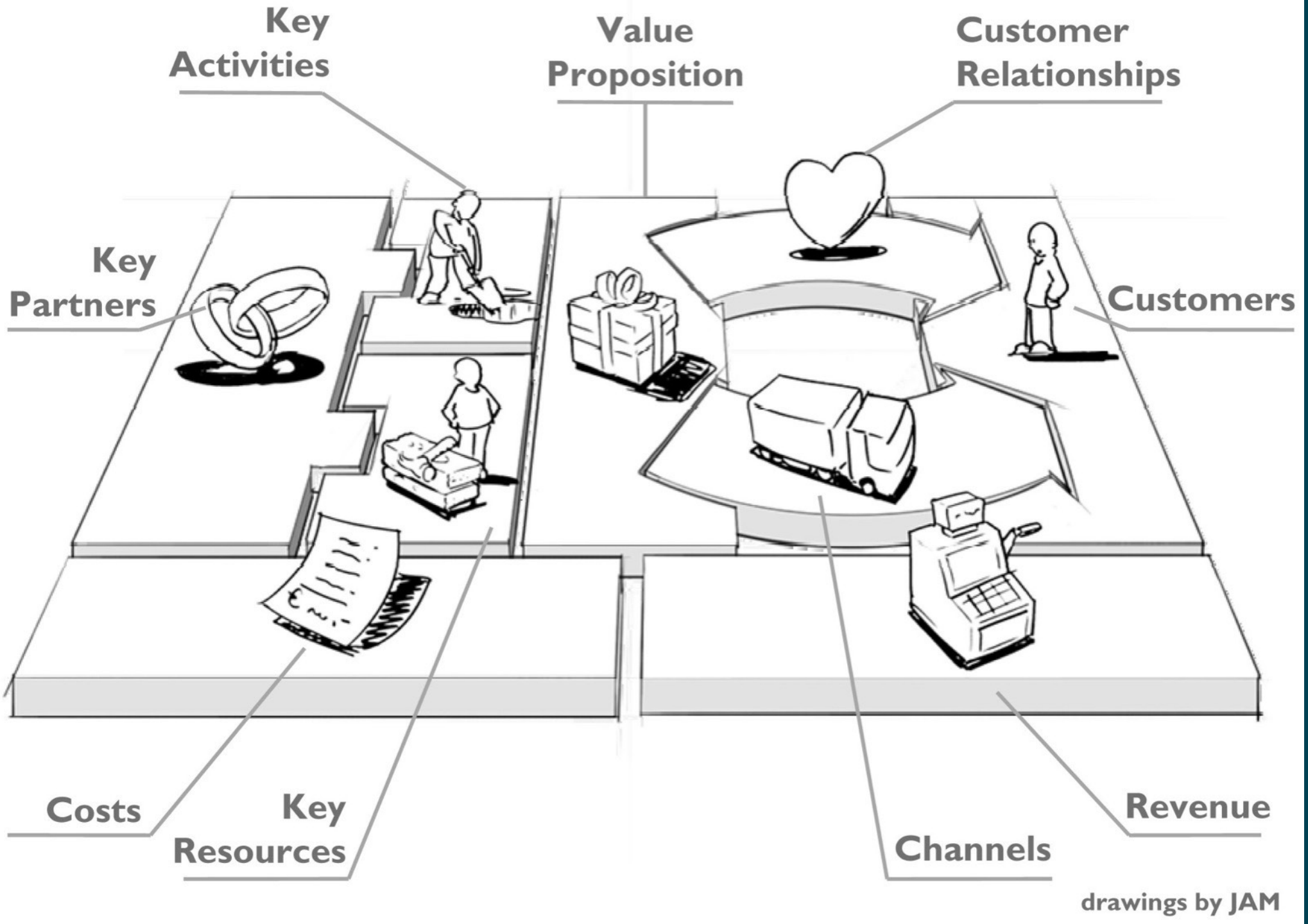


whow!

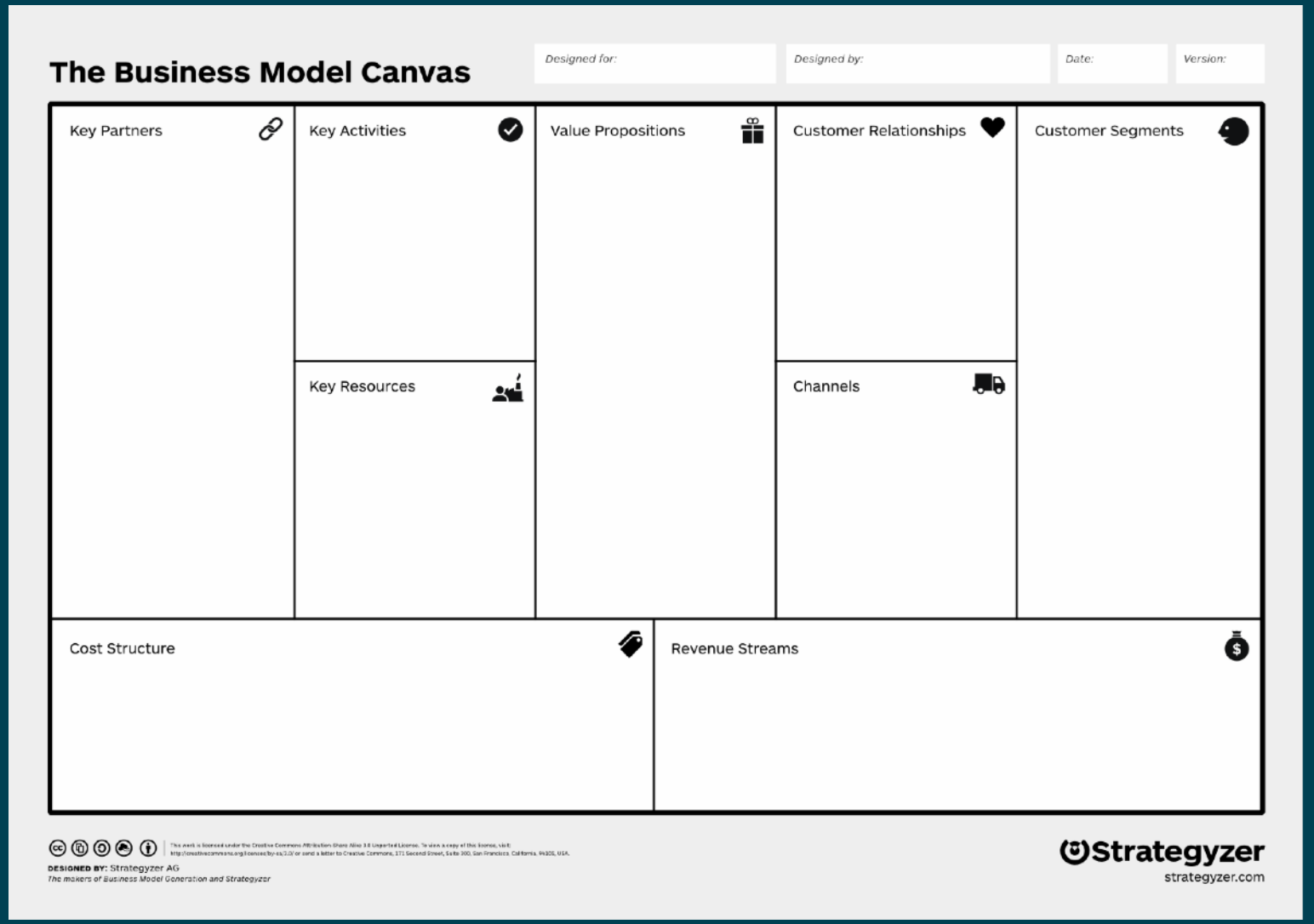
https://www.strategyzer.com/books

Business Model Canvas

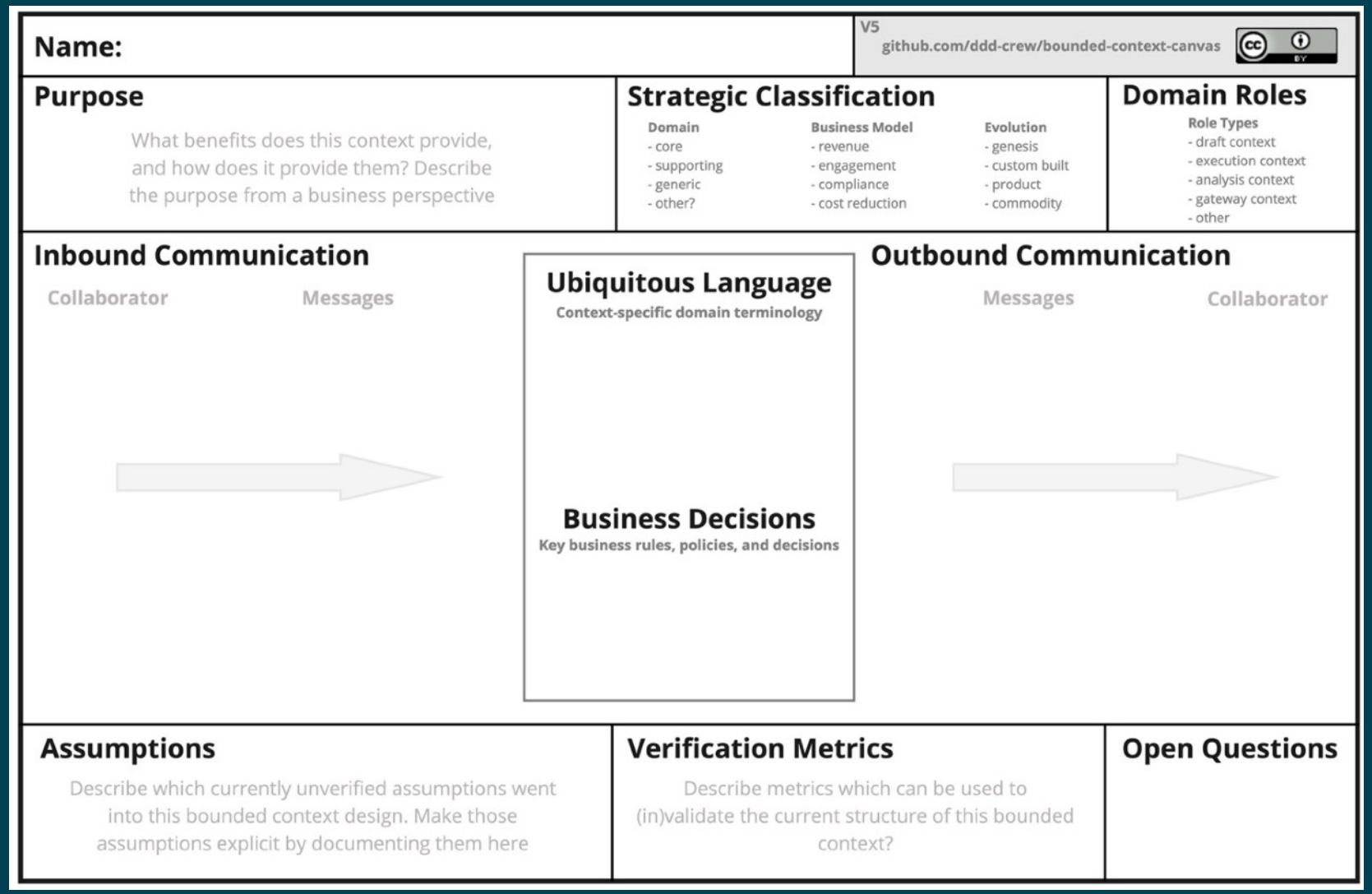
https://www.projectwizards.net/en/blog/2019/09/business-model-canvas



Business Model Canvas



Bounded Context Canvas



many more ...

Empathy Map Canvas

Feedback Canvas

Gamification Model Canvas

Growth Hacking Canvas

Lean Canvas

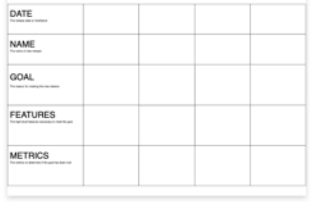
Lean Change Canvas

Matchup Canvas

Meeting Facilitator Canvas

Future of Work Canvas

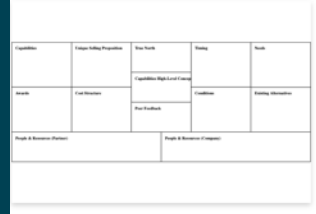
GO Product Roadmap Canvas



HR Innovation Canvas

Internal Communication Model Canvas

Lean Procurement Canvas



MVP Experiment Canvas

Mission Model Canvas

Organization Canvas

Personal Business Model Canvas

Personal Service Model Canvas

Product Vision Board Extended Canvas

Product-Market-Fit Canvas

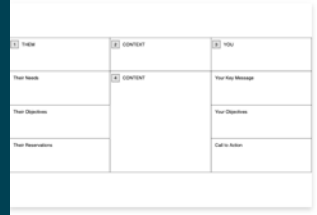
Pros & Cons Canvas

Q&A Horizontal Canvas

Roman's Product Canvas

SWOT analysis

Pitch Planner Canvas



Platform Design Can

Project Canvas

Project Canvas Over Fence

Q&A Vertical Canvas

Requirements Discov Canvas

Social Lean Canvas

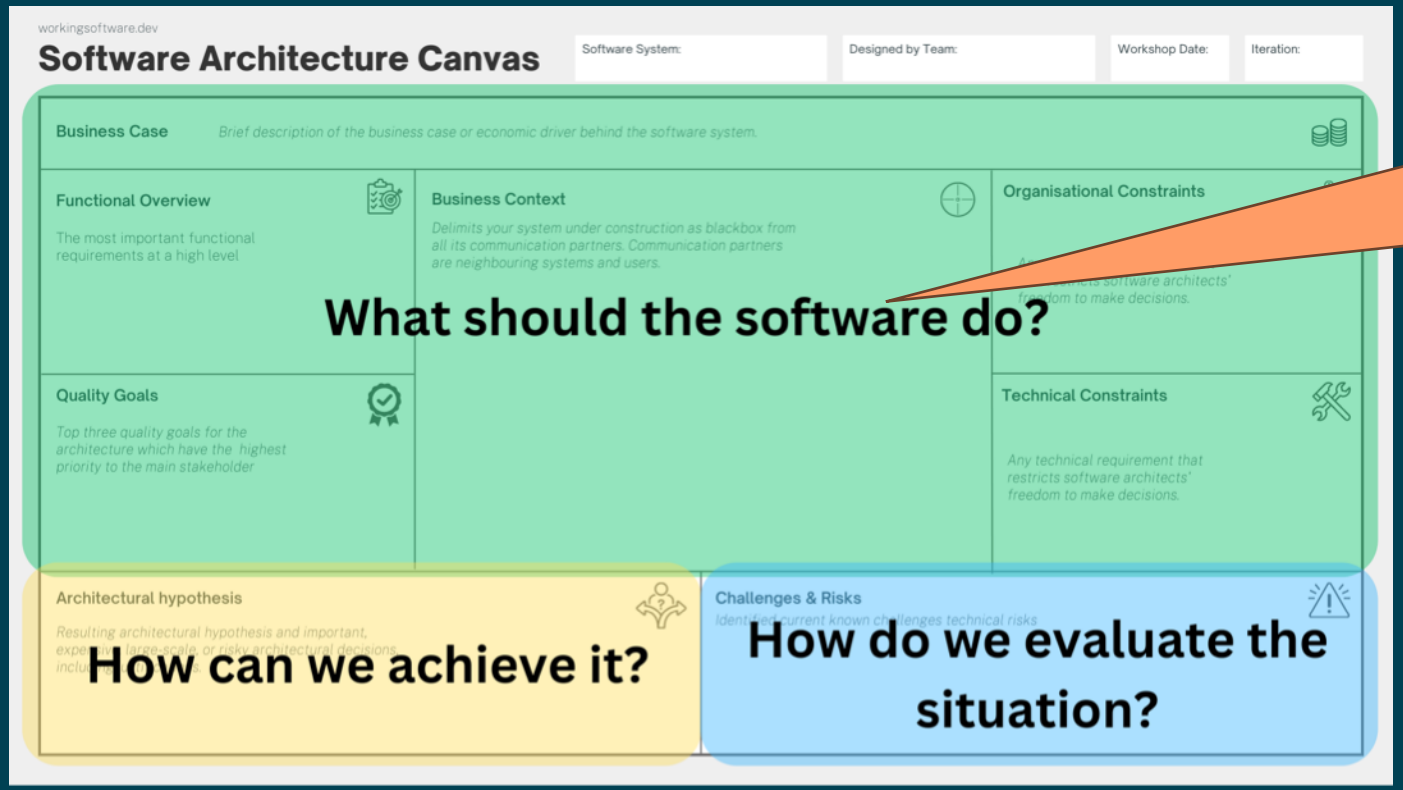
Software Testing Can

https://canvanizer.com

Thanks, Patrick!

https://www.workingsoftware.dev/software-architecture-canvas/

Thanks, Patrick!



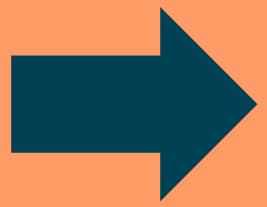
for
new systems

https://www.workingsoftware.dev/software-architecture-canvas/

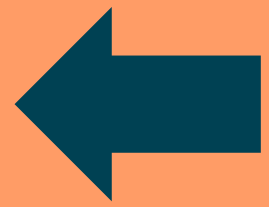
Agenda

ACC

architecture communication canvas

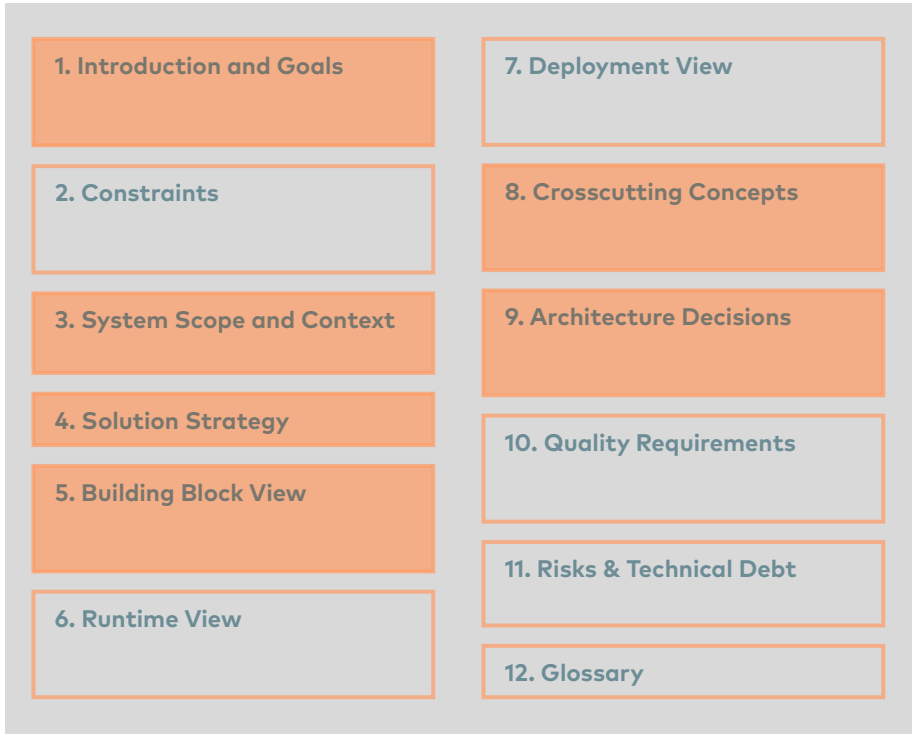


arc42 in a nutshell



What is a Canvas?

arc42 in a nutshell



1. Introduction and Goals
1.1 Requirements Overview
1.2 Quality Goals

→ Main requirements, especially quality goals

3. System Scope and Context
-> **external interfaces**

→ Neighbouring systems and external interfaces

4. Solution Strategy

→ Core idea of the solution, suggestion: bullet points only

5. Building Block View
5.1. Whitebox Overall System (Level 1)

→ Top-level structure of the code

8. Crosscutting Concepts

→ Cross-cutting concepts, highly detailed

9. Architecture Decisions

→ Important archictecture decisions, incl. decision makers and date

Agenda

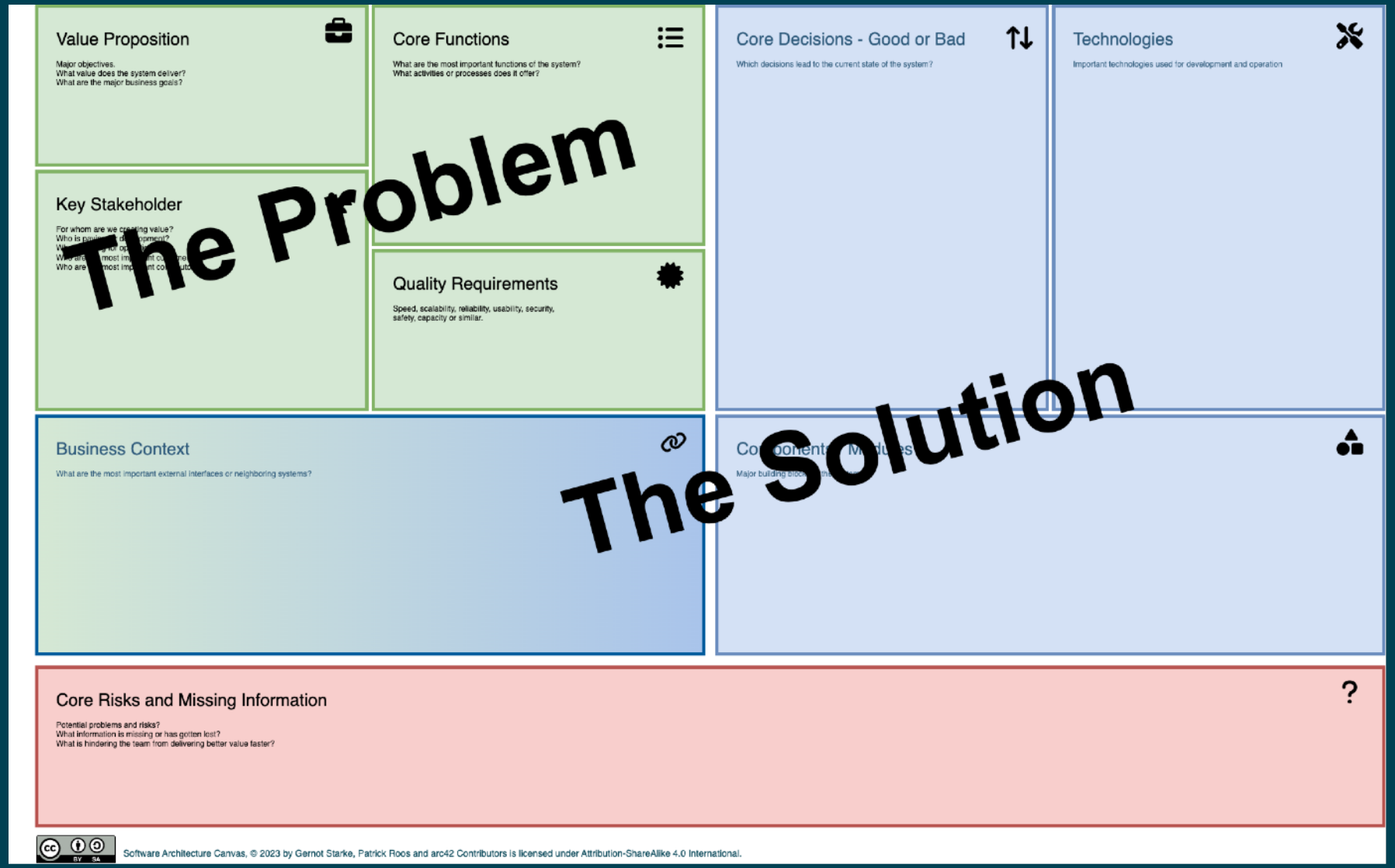
ACC

architecture communication canvas

arc42 in a nutshell

What is a Canvas?

Structure of the Canvas



Original Key Questions

- Business-Case-in-half-a-Tweet

- The 3 most important quality attributes
- Key Stakeholders

- Most important technologies
- Proud factors and worst decisions

Original Key Questions

- Business-Case-in-half-a-Tweet
- The 3 most important capabilities
- The 3 most important quality attributes
- Key Stakeholders
- Most important neighbouring systems
- Most important components
- Most important technologies
- Proud factors and worst decisions
- Risks and issues

Architecture Communication Canvas

System:	Created by:	Created for:	Date / Iteration:

Value Proposition

Major objectives.
What value does the system deliver?
What are the major business goals?

Core Functions

What are the most important functions of the system?
What activities or processes does it offer?

Core Decisions - Good or Bad

Which decisions lead to the current state of the system?

Technologies

Important technologies used for development and operation

Key Stakeholder

For whom are we creating value?
Who is paying for development?
Who is paying for operations?
Who are our most important customers?
Who are our most important contributors?

Quality Requirements

Speed, scalability, reliability, usability, security, safety, capacity or similar.

Business Context

What are the most important external interfaces or neighboring systems?

Components / Modules

Major building blocks of the system

Core Risks and Missing Information

Potential problems and risks?
What information is missing or has gotten lost?
What is hindering the team from delivering better value faster?

https://canvas.arc42.org

Use for Reviews

- Create canvas prior to review
- Common understanding
- Remind participants of „everything“

https://unsplash.com/de/fotos/-4trKfoKbow

Use to Kickstart

- Fastest possible start
- Avoid blank-paper syndrome

Use in an Emergency

- Fastest possible docu
- If nothing else works...

Examples

ACC

architecture communication canvas

arc42 in a nutshell

What is a Canvas?

Health-Insurance Card

Architecture Communication Canvas

System:	Created by:	Created for:	Date / Iteration:
MaMa CRM	arc42 team	presentation	November 2023 / 1

Value Proposition

MaMa is a multi-tenant SAAS platform to produce e-health cards for insurance companies, providing maximum flexibility with regards to data formats and business rules.

Core Functions

- SAAS to create eHealth cards
- Get photo from insured person
- 2nd level support for eHealth data acquisition process

Core Decisions - Good or Bad

+ operate MaMa as SaaS
+ domain-specific configuration
+ one tenant per VM
+ 100% generated persistence, incl. DB

- batch only data transfer
- ProcessControl subsystem violates SoC

Technologies

- Eclipse RCP frontend
- JBoss Drools rule engine
- Quartz scheduler
- Oracle DB

- Dedicated server, with Linux KVM hypervisor

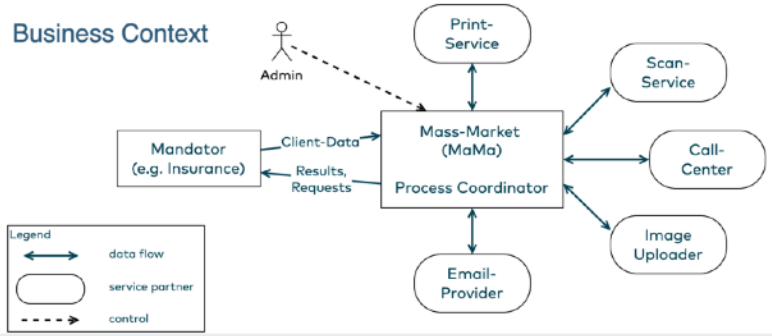
Key Stakeholder

- Hosting Provider
- Tenants: health insurance companies
- Government regulation body (Gematik GmbH)
- DRVB Rentenversicherung Bund
- Print service provider
- Scan service provider
- G&D card issuer
- TÜV (auditor)
- BSI (auditor)

Quality Requirements

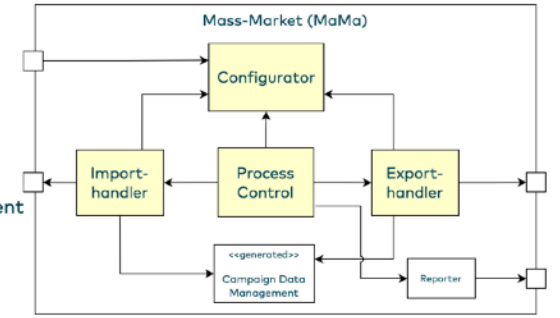
1. Strict separation of tenant data
2. New data always processed until end of business day

Business Context



Components / Modules

- Configurator
- Import handler
- Export handler
- ProcessControl
- (generated) Campaign DataManagement



Core Risks and Missing Information

- Outdated UI (Eclipse RCP)
- Batch strategy limits acceptance
- No end-user self-service options

https://canvas.arc42.org

Salary Management

Architecture Communication Canvas

System:	Created by:	Created for:	Date / Iteration:

Value Proposition

- Adjust salary per employee
- Compare salaries
- Prevent a pay gap
- Less errors due to less manual steps

Key Stakeholder

- Executive Board
- Back office
- Employees

Core Functions

- Create, edit and approve agreements
- Create and edit benefits
- Compare salaries of employee groups
- View your own agreement and your agreement history

Quality Requirements

1. Maintainability
2. Security
3. Reliability

Core Decisions - Good or Bad

+ SpringBoot + ecosystem as core framework
+ PostgreSQL database
+ Test-driven development approach

o Liquibase for db schema management

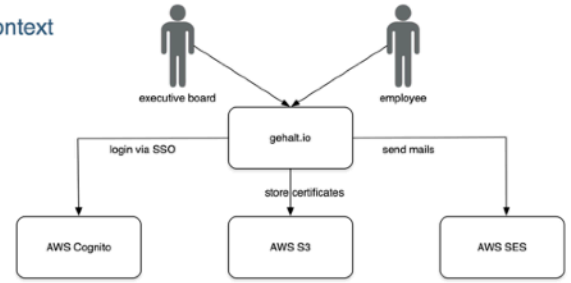
- JavaScript libraries for visualisation
- Translating terms to English instead of using Ubiquitous Language (German)
- Secure but complex deployment to AWS

Technologies

- Gradle 8
- Spring Boot 3
- Java 17
- jUnit 5
- Thymeleaf
- Node 18
- Vega, D3, Faucet (js libraries)

- AWS (Cognito, S3, SES, ECS, Lambdas)

Business Context



Components / Modules

- AgreementManagement
- BenefitManagement
- EmployeeManagement
- Audit
- AccessControl
- Notifications

Core Risks and Missing Information

- Limited access to development resources
- Better existing (SaaS) solutions available?
- Deployment tends to be too complex

https://canvas.arc42.org

Open-Source HTML Sanity Checker

Architecture Communication Canvas

Software System: **HtmlSanityCheck**

Designed by Team: aim42

Value Propositions

get rid of typical hyperlink errors in html documents

Core Functions

check for and **report**:
- missing images/resources
- wrong links
- duplicate anchors

suggest corrections

Core Decisions - Good or Bad

- open-source (Github)
- Flexible due to TemplateMethod pattern
- virtually no dependencies
- powerful reporting
- helpful suggestions

- use Gradle as execution environment
- BDD approach not applied consistently

Technologies

Programming language: https://groovy-lang.org/

HTML parser: https://jsoup.org/

Execution / Deployment: via https://gradle.com/

Testing based upon https://spockframework.org/

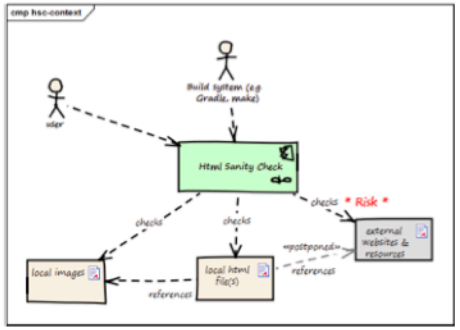
Key Stakeholder

authors
- generating html of their documents
- writing in AsciiDoc, Markdown or similar

Quality Requirements

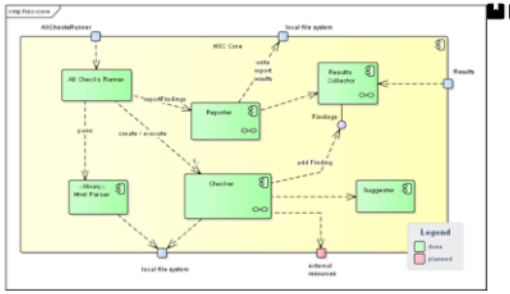
- no source document is ever changed
- all missing links/resources are found
- performance comparable to unit tests (< 1sec)

Business Context



Components / Modules

AllChecksRunner	Coordinates the various (and configurable) types of checks, sends collections of findings to Reporter.
HtmlParser	the JSOUP parser, returns an in-memory representation of the respective HTML file.
Reporter	creates a JUnit-style report in HTML, containing both errors and suggestions
ResultsCollector	Gathers all results (errors and suggestions)
Suggester	Tries to give suggestions what could have been meant, especially for image links (e.g. if missing file is "a.jpg" and "a.png" exists on filesystem)
Checker	coordinates and executes all (configured) checks on the (configured) html file(s). Calls for suggestions in case of errors, reports findings to ResultsCollector



Risk and Missing Information

- community too small to support regular updates
- dependency on gradle hinders adoption
- Some weird dependencies in code
- outdated documentation due to pure-code-commits
- outdated technologies (e.g. Gradle 4)

„Cognitive Science" Bachelor Thesis

Architecture Communication Canvas

System: Recipe Recommender

Value Proposition

Collect the data needed to answer the research question of this thesis

Key Stakeholder

- Researcher
- User
- Coach
- Rater

Core Functions

- Display and rate recipes
- Recommend recipes using two different algorithms
- Collect ratings for evaluation

Quality Requirements

- good user experience
- device independency
- adequate development effort
- diverse recipe database

Core Decisions - Good or Bad

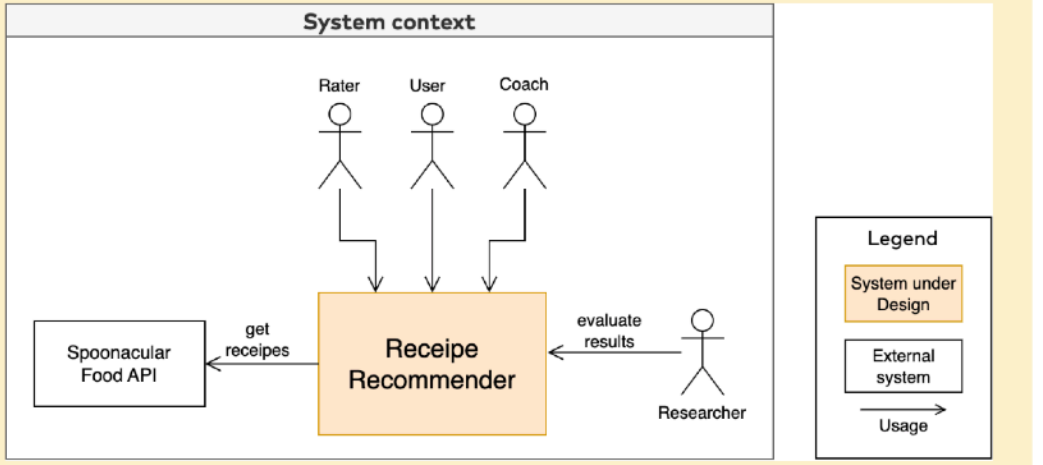
+ Public GitHub repository for development and collaboration with thesis supervisor, using GitHub issues and Kanban-board
+ Using efficient tech-stack
+ Using Spoonacular for recipes

– Manuel deployment
– Not having relational database
– Not having automated tests

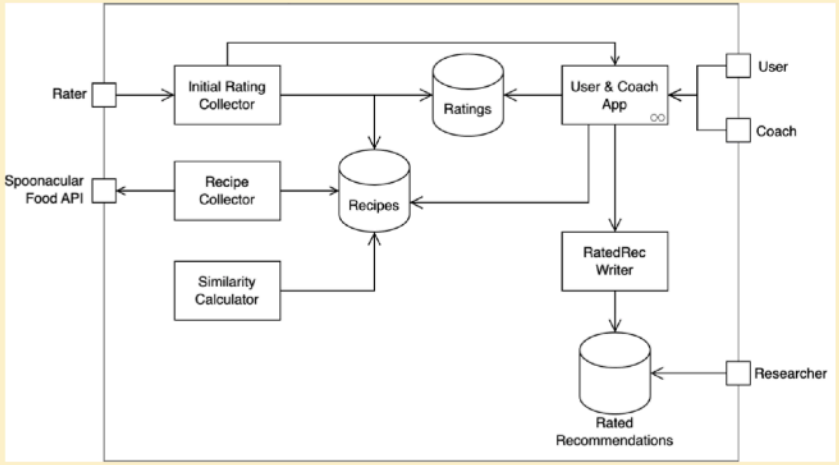
Technologies

- Python and libraries:
  - Flask
  - Pandas
  - CaseRec
- csv and json files as data storage

Business Context



Components / Modules



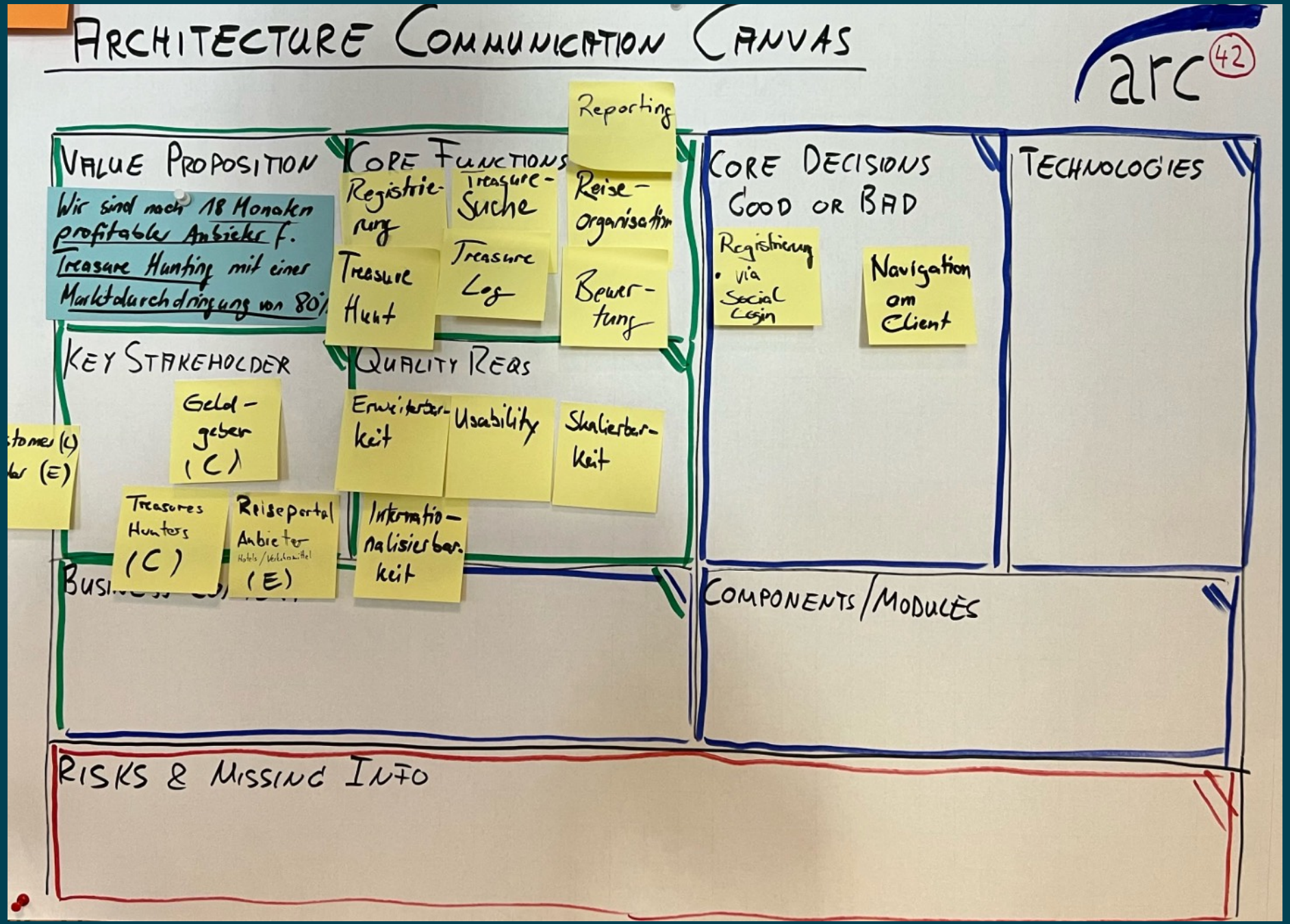
lower effort than other approaches

Real Talk

- **Valuable documentation in less than 2 hours!**
- **Aha moments! Lost treasures! Fun!!**
- **Getting started with documentation!**

With ACC, I was well-prepared

well-invested 90 minutes


ARCHITECTURE COMMUNICATION CANVAS
arc 42
VALUE PROPOSITION
Wir sind nach 18 Monaten profitabler Anbieter f. Treasure Hunting mit einer Marktdurchdringung von 80%
CORE FUNCTIONS
Registrierung
Treasure-Suche
Reporting
Reise-organisation
Treasure Hunt
Treasure Log
Bewertung
CORE DECISIONS GOOD OR BAD
Registrierung • via Social Login
Navigation am Client
TECHNOLOGIES
KEY STAKEHOLDER
Geldgeber (C)
Treasures Hunters (C)
Reiseportal Anbieter (E)
QUALITY REQS
Erweiterbarkeit
Usability
Skalierbarkeit
Internationalisierbarkeit
COMPONENTS/MODULES
RISKS & MISSING INFO

More Info on ACC

The Big Picture

Architecture
Inception
Canvas

workingsoftware.dev

Architecture
Communication
Canvas

canvas.arc42.org

Tech Stack
Canvas

techstackcanvas.io

arc42

Architecture Inception Canvas → Architecture Communication Canvas → Tech Stack Canvas

Architecture Inception

workingsoftware.dev

Software Architecture Canvas

Software System:	Designed by Team:	Workshop Date:	Iteration:

Business Case *Brief description of the business case or economic driver behind the software system.*

Functional Overview

The most important functional requirements at a high level

Business Context

Separate your system under construction as a black box from all its communication partners. Communication partners are neighbouring external systems and users.

Organisational Constraints

Any organisational requirement that limits the software architects' freedom of decision.

Quality Goals

The three most important quality goals for the architecture, which have the highest priority for the most important stakeholder

Technical Constraints

Any technical requirement that restricts the software architects' freedom of decision.

Architectural hypotheses

Resulting architectural hypotheses and important, expensive, large-scale or risky architectural decisions, including justifications.

Technical Challenges & Risks

Identified current known challenges technical risks

Version 1.0

Tech Stack Canvas

Business Goals

main objectives this project tries to achieve

Frontend Technologies

languages, tools and frameworks used for developing the user interface and user experience

API & Integrations

third-party services used to extend the functionality of the product or service

Security & Compliance

tools, practices, and standards implemented to ensure the security and privacy

Sizing Numbers

that influenced decisions, such asnumber of users, requests per second, data volumes

Backend Technologies

technologies used for server-side processing, data management, and business logic implementation

Testing & QA

tools and methodologies used to test the application's functionality, performance, and security

Major quality attributes

that influenced decisions, such as availability, fault tolerance, learnability, adaptability

Data Storage & Management

technologies used for data storage, retrieval, and processing

Infrastructure & Deployment

platforms, tools, and services used for hosting, deploying, and managing the application

Monitoring & Analytics

tools and services used to monitor the application's performance, track user behavior, and gather insights for optimization

Development Workflow & Collaboration

tools and processes used to facilitate efficient development and collaboration among team members

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INNOQ

www.innoq.com