Photo by Raychan on Unsplash

Architecture Communication Canvas

Useful Architecture Documentation in ~~60~~ 45 Minutes

GERNOT STARKE

INNOQ

BENJAMIN WOLF

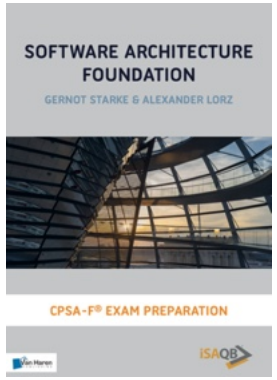
„Es ist nicht zu wenig Zeit, die wir haben, sondern zu viel Zeit, die wir nicht nutzen."

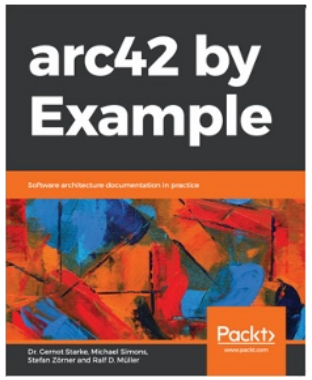
Seneca

Gernot Starke

Fellow
at INNOQ

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



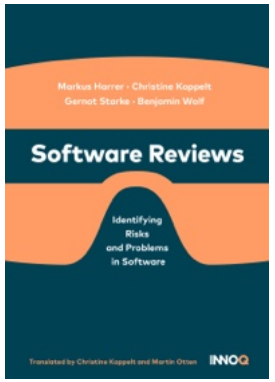


„Jedes Problem lässt sich mit gutem Kaffee lösen.“

Benjamin Wolf

Senior Consultant / Coffee Consultant bei INNOQ

Consultant für Architekturentwicklung / -dokumentation
Trainer für iSAQB Foundation, IMPROVE und ADOC
arc42-Fan und -Maintainer
Kaffeegenussspecht



architecther.co.uk

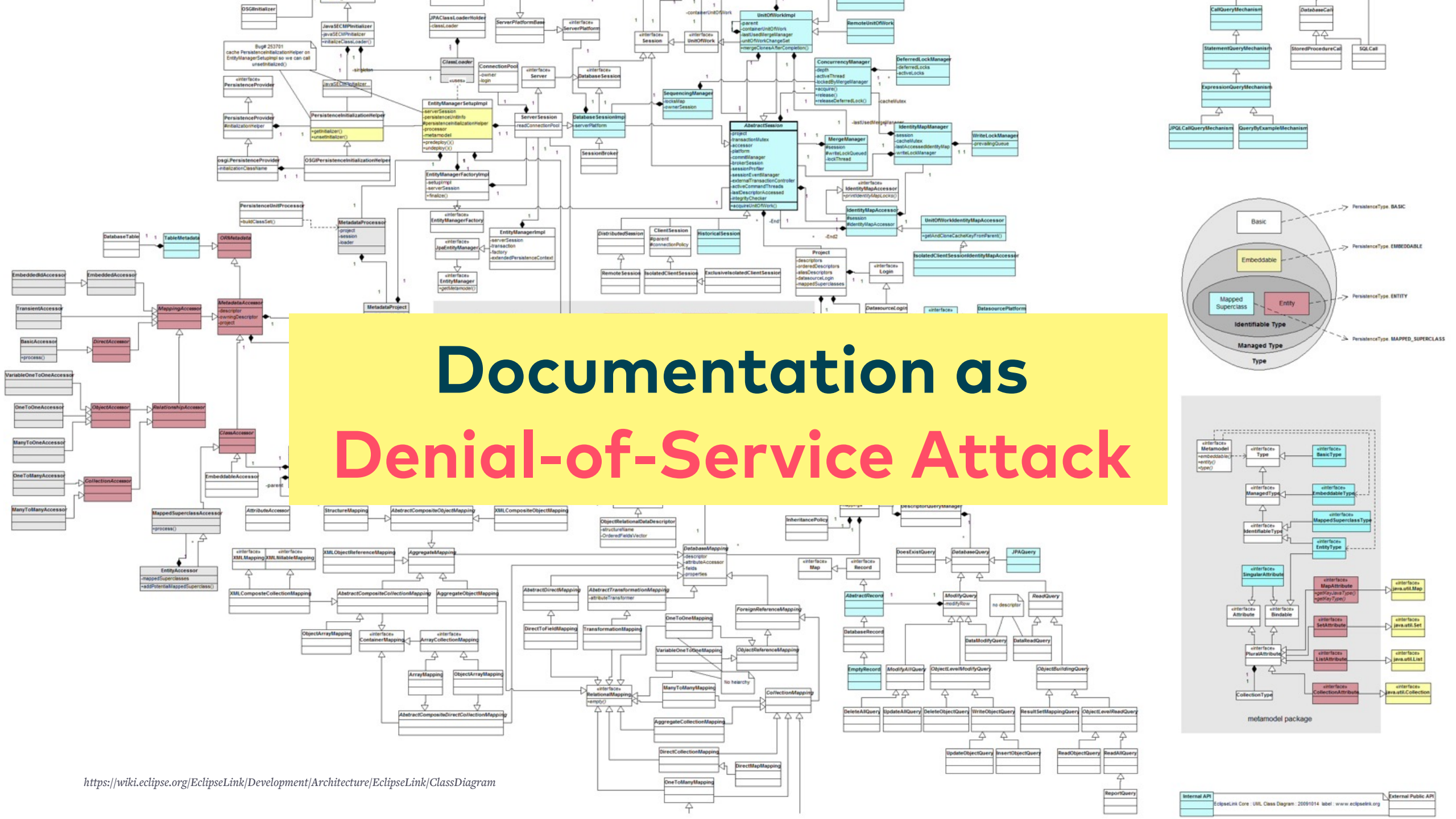
Why this topic?

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

arc42 in a nutshell

What is a Canvas?

Tech-Documentation 101

Agenda

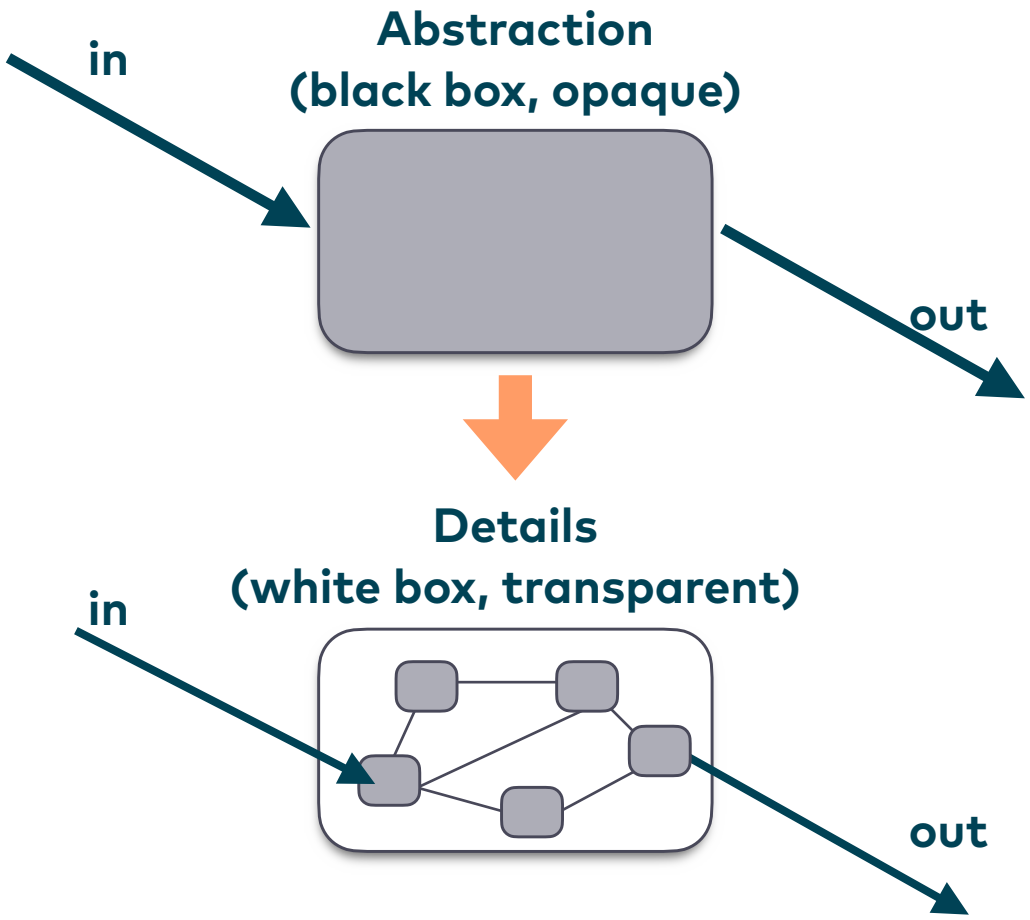
ACC

arc42 in a nutshell

What is a Canvas?

Document less, but clever!

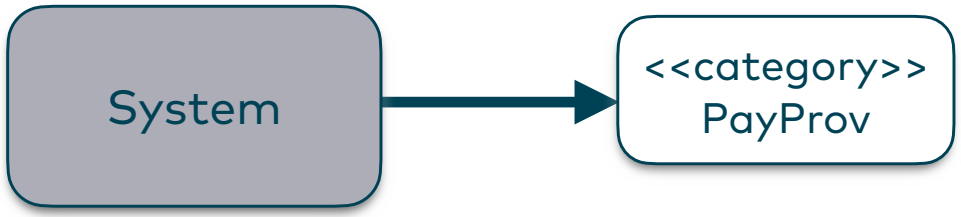
Abstraction is your best friend!



very sparse

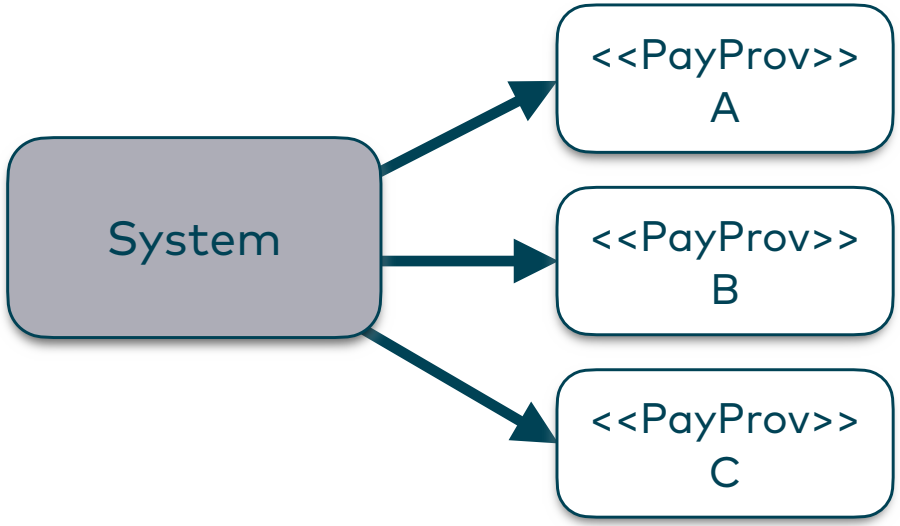
less sparse!

Courage to leave things out* (1)



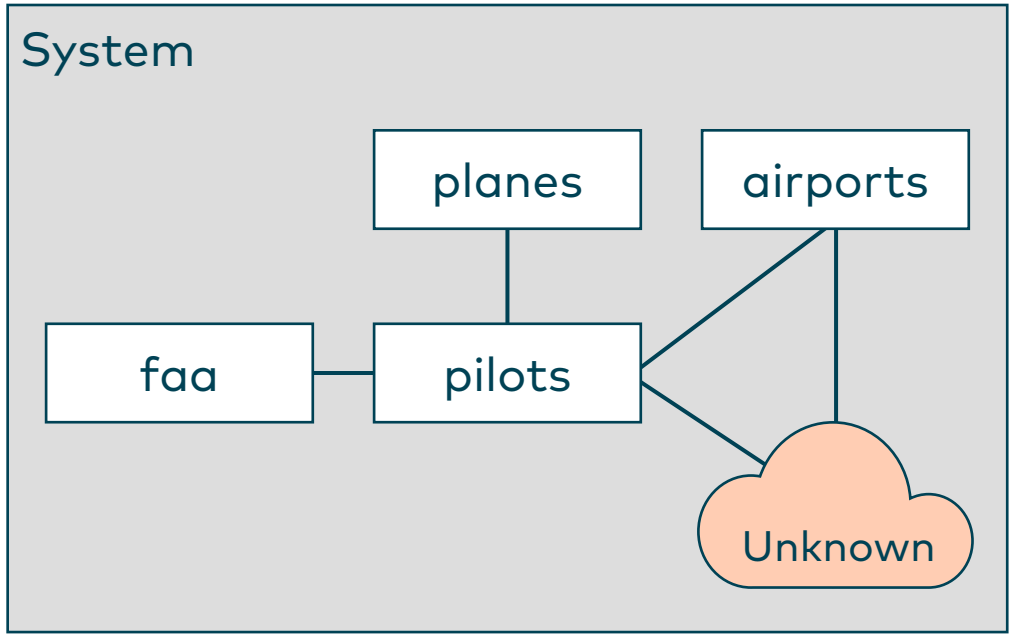
Element	Description
PayProv	All our payment providers A-D

sparse



less sparse!

Courage to leave things out* (2)



sparse

Some more details

other funky stuff

Agenda

ACC

arc42 in a nutshell

What is a Canvas?

Document less, but clever!

once upon a time...

best research system for authors

online news media

- php
- old linux version

J Smith
PO
A Markov
CTO

- newsfeed aggregator comp
- news validator comp
- news summarizing comp

people leaving

structure daily content

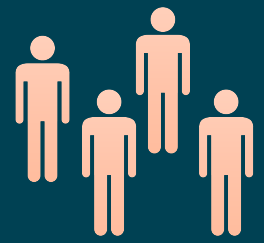
int news aggregato r

- java
- TS
- node

J Smith
PO
A Markov
CTO

- headline viewer
- layout preview

lib updates too often



Security advisory

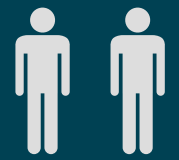
all libs and OS Github bot

- Python
- Bash
- make

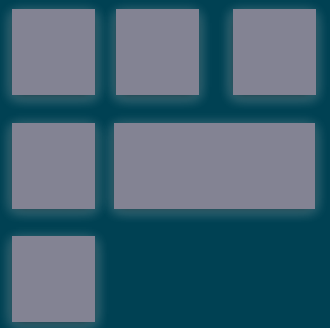
CSO

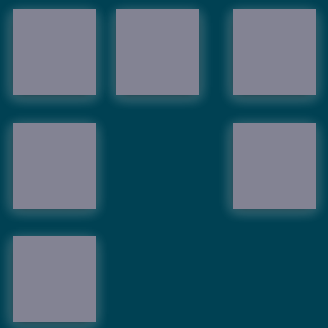
- scanner
- owasp-10 reader
-

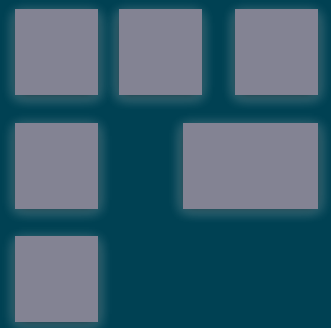
DIY sec considered bad practice



once upon a time...







Can-what?

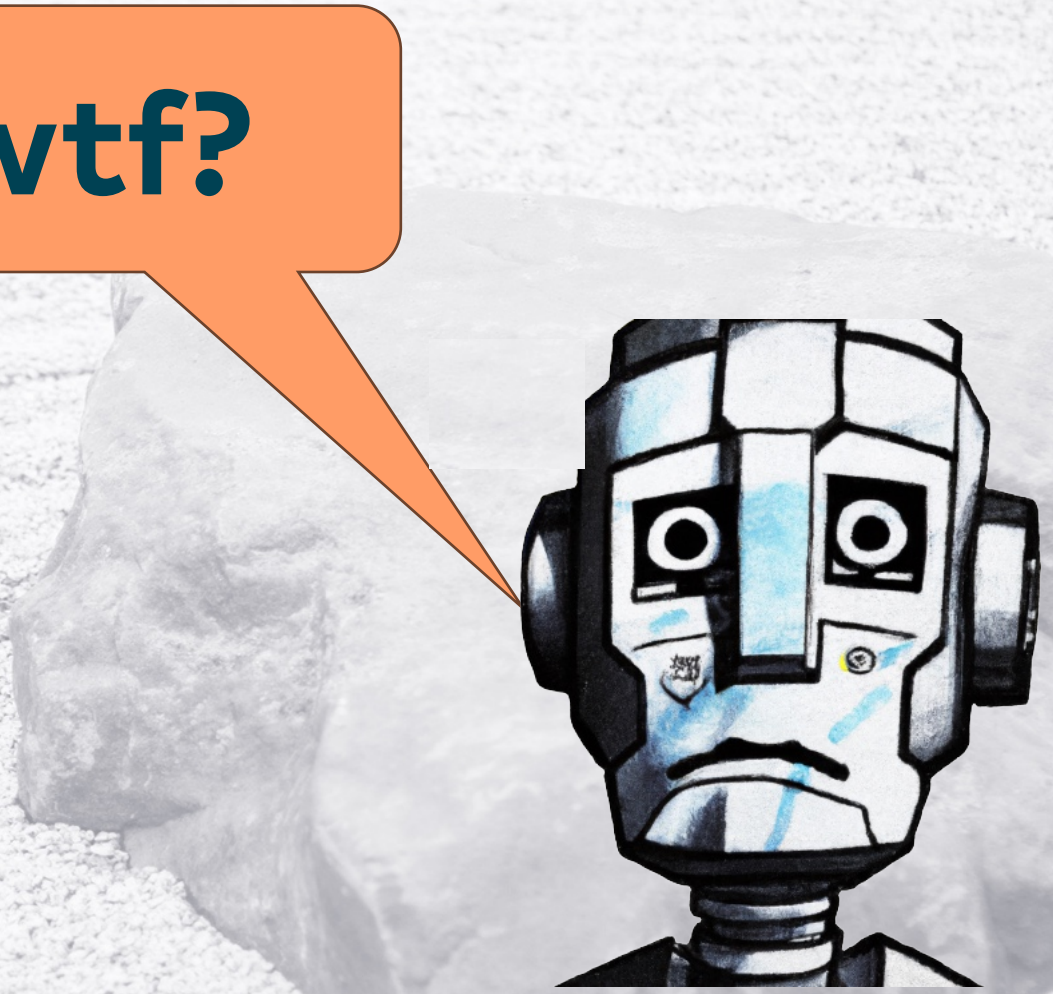


Photo by Kari Shea on Unsplash

Canvas
[en: KannWas]

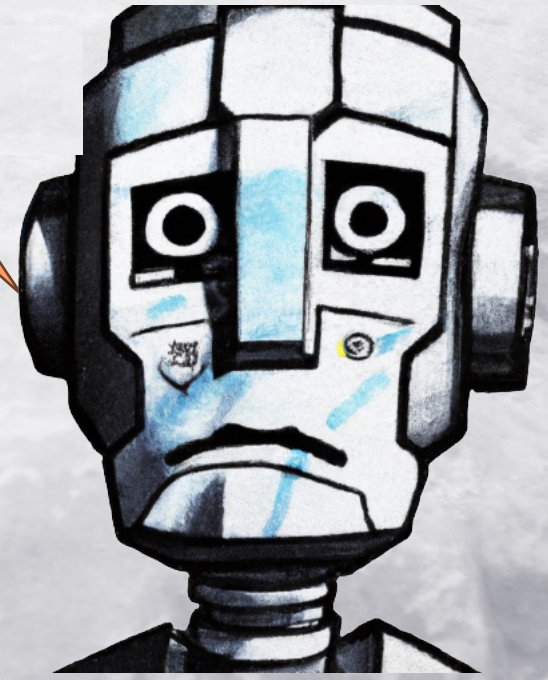


Photo by Kari Shea on Unsplash

explained by chatGPT 3

Canvas (1)

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

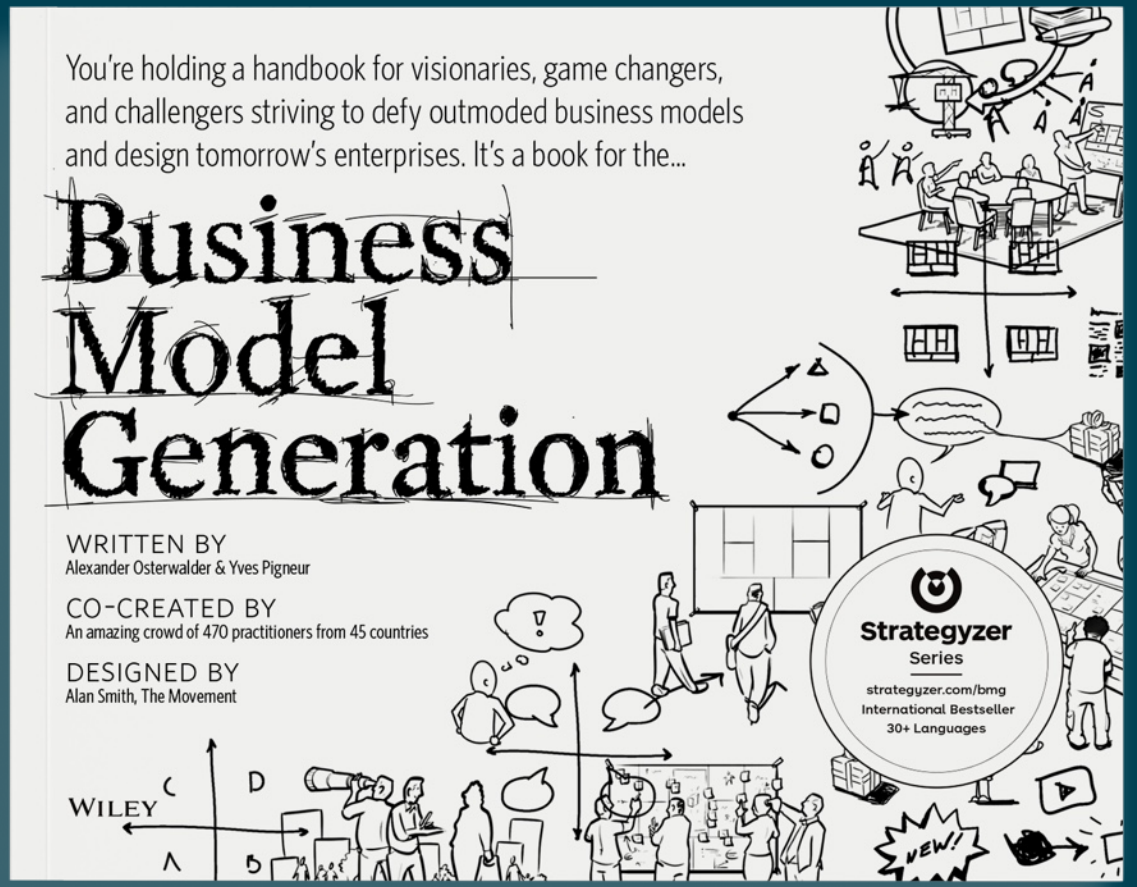
https://chat.openai.com/share/ce9455a9-4d17-4e32-a590-a53136ea481a

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

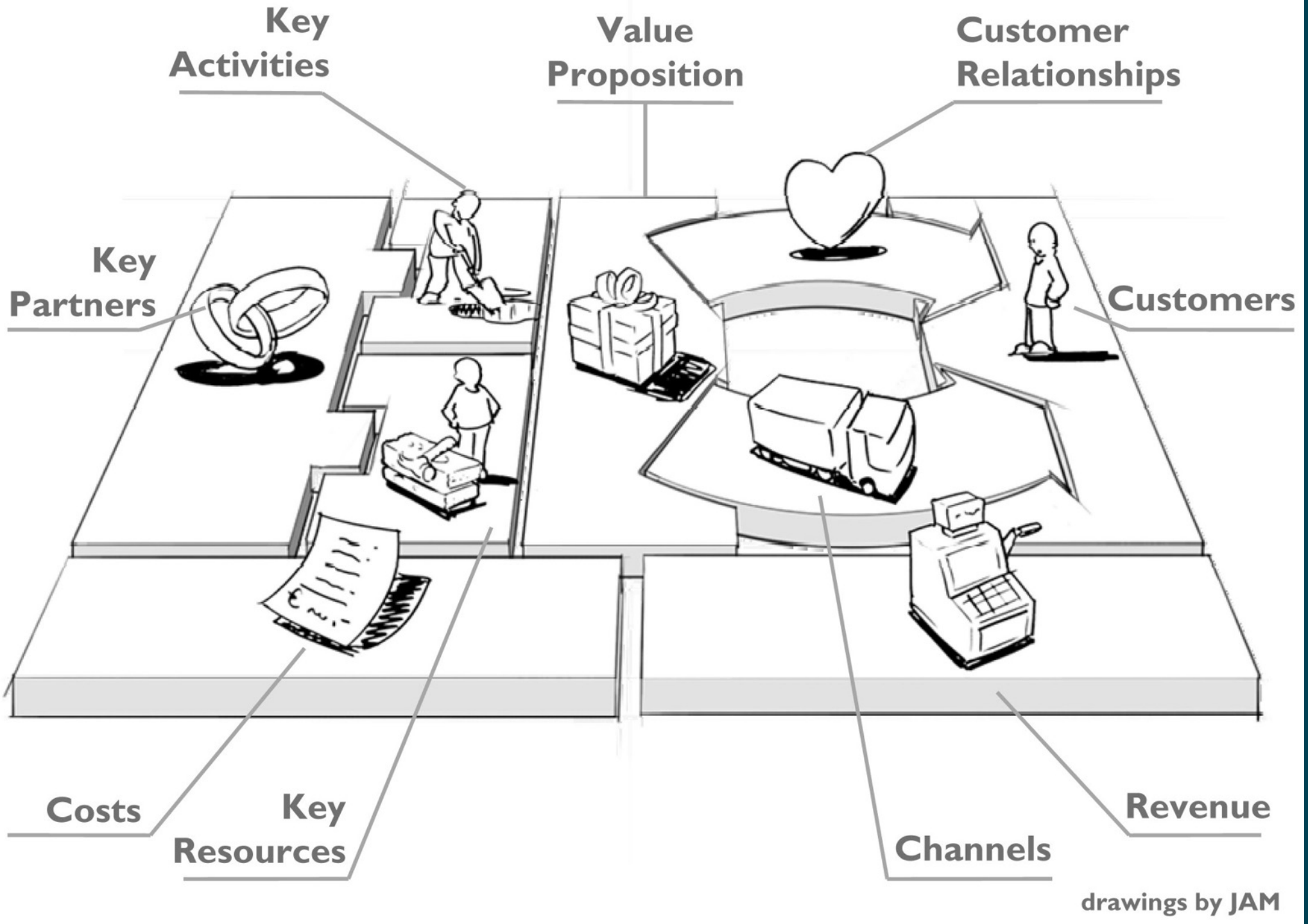


WOW!

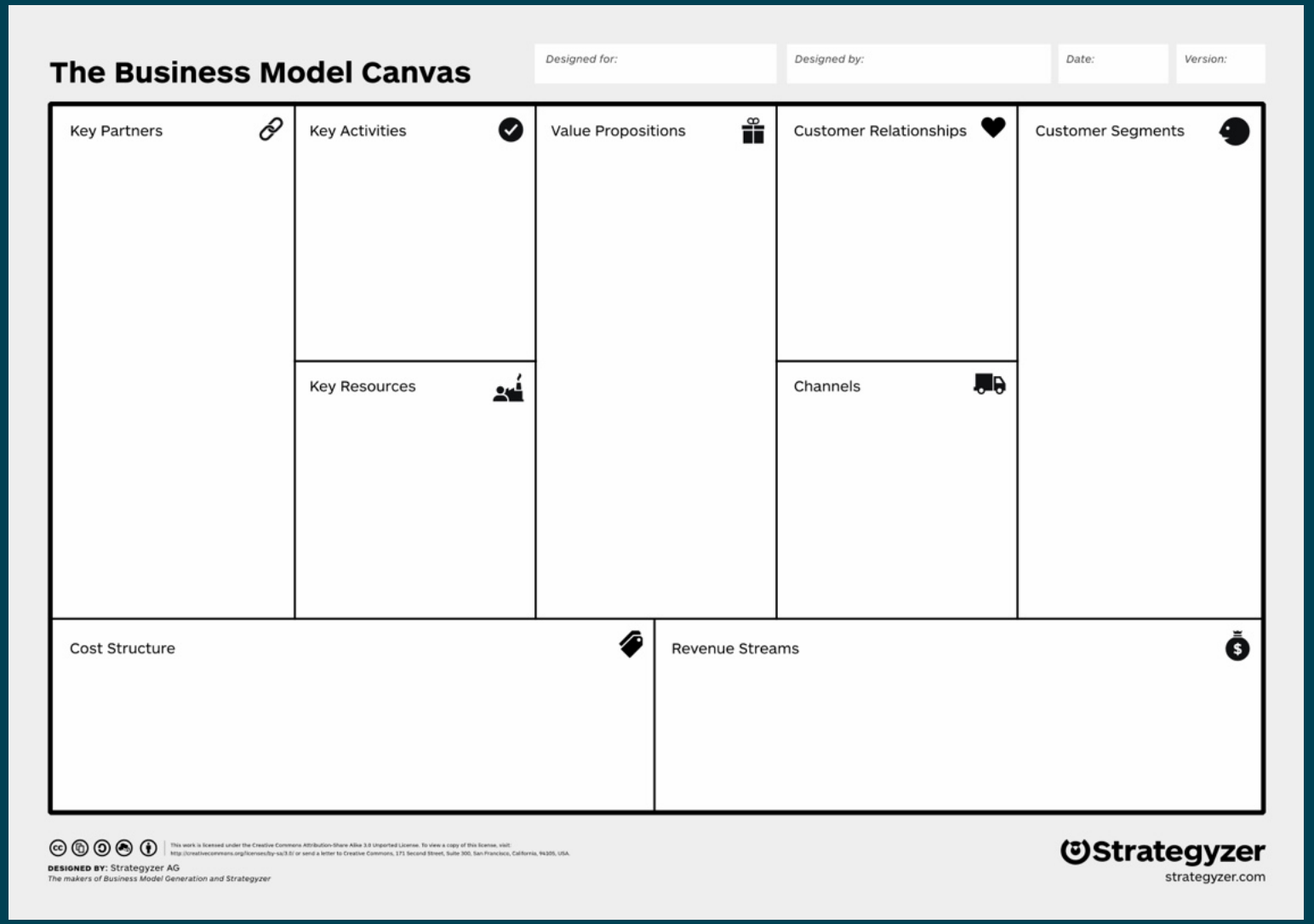
https://www.strategyzer.com/books

Business Model Canvas

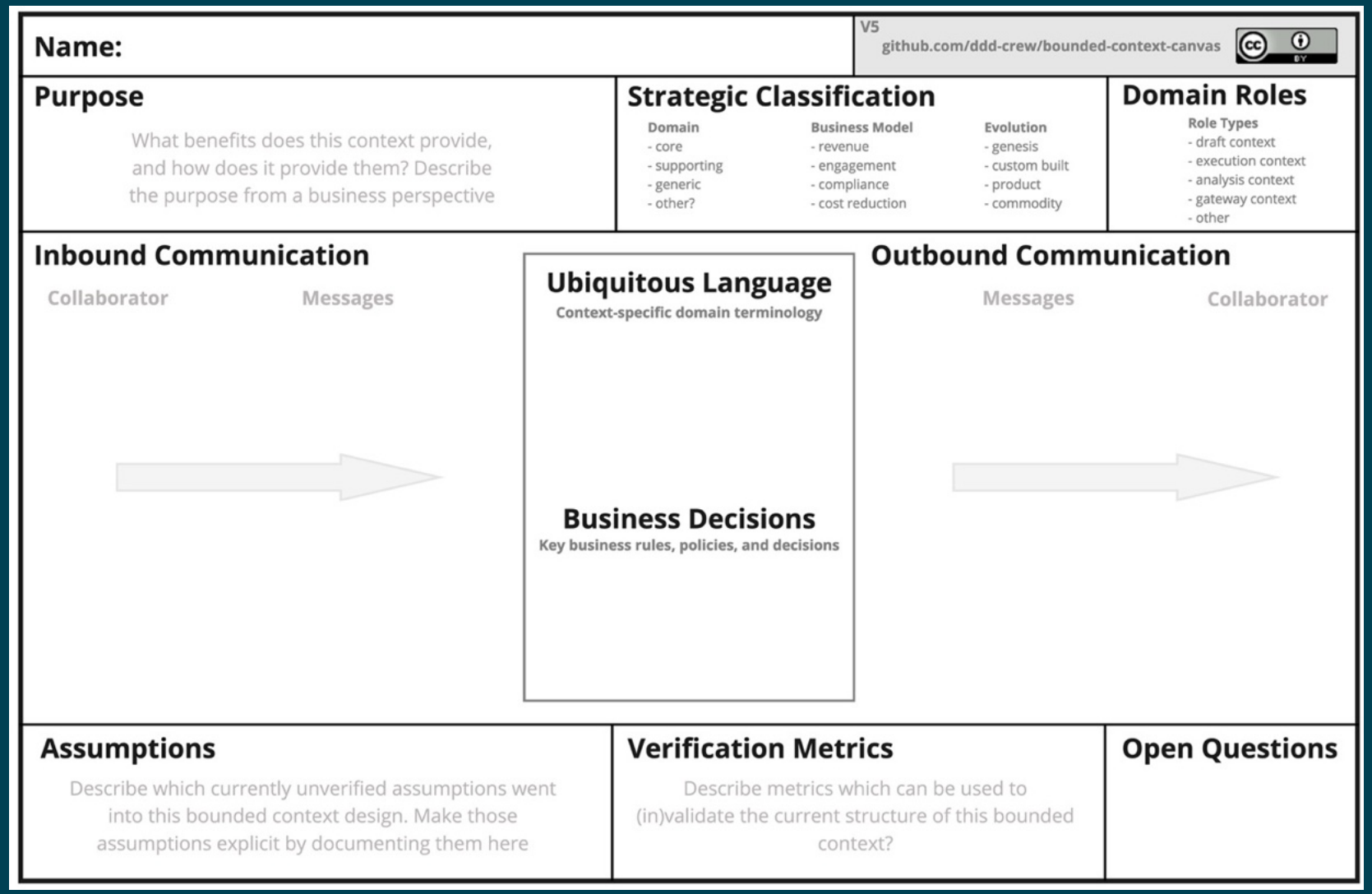
https://www.projectwizards.net/en/blog/2019/09/business-model-canvas



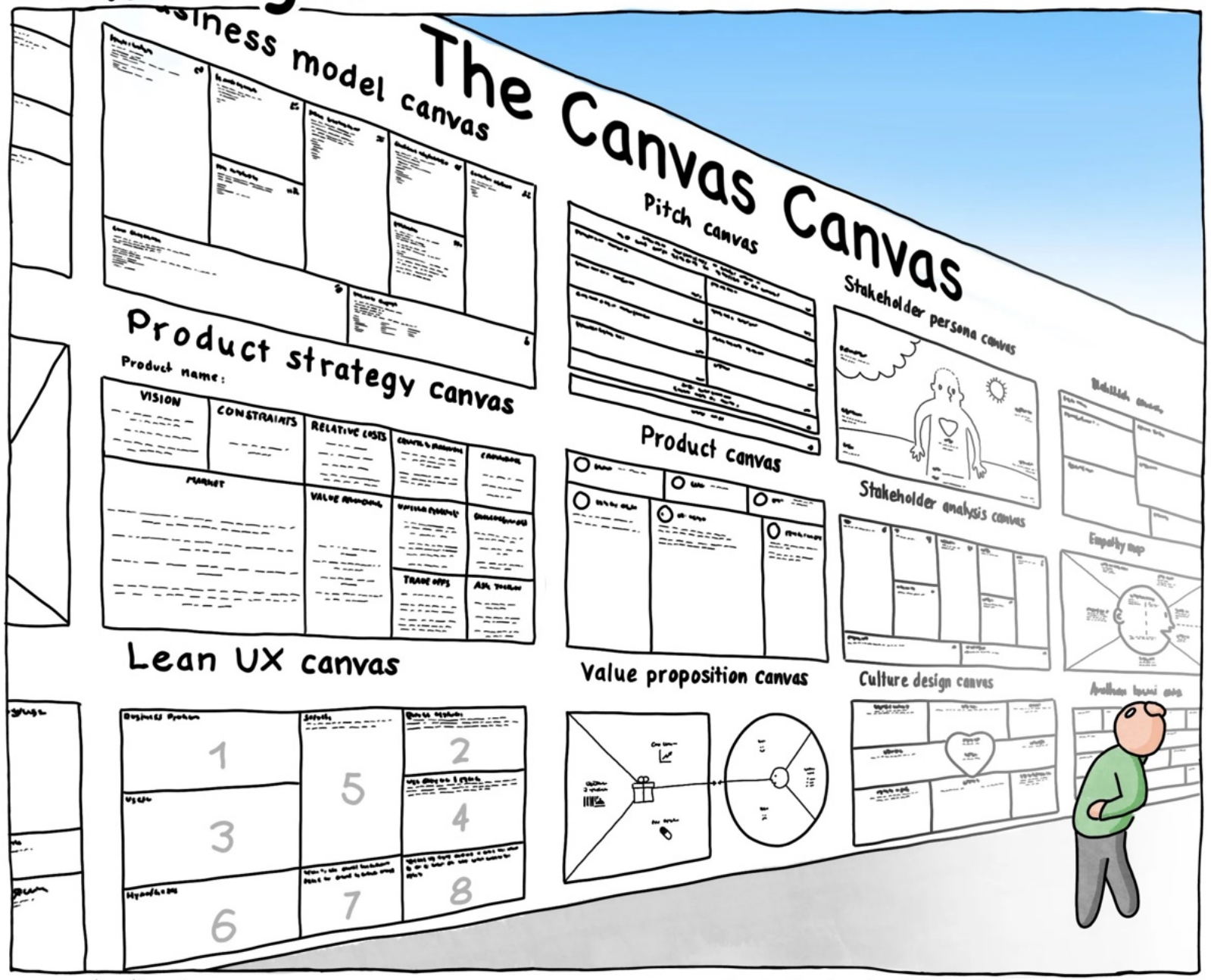
Business Model Canvas



Bounded Context Canvas



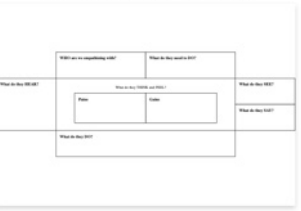
Comic Agilé



Created by Luxshan Ratnaravi & Mikkel Noe-Nygaard

many more ...

Empathy Map Canvas



Feedback Canvas

Gamification Model Canvas

Growth Hacking Canvas

Lean Canvas

Lean Change Canvas

Matchup Canvas

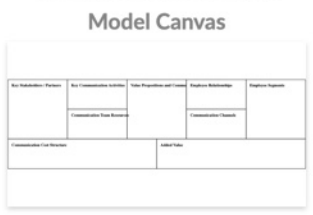
Meeting Facilitator Canvas

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

Why not ...

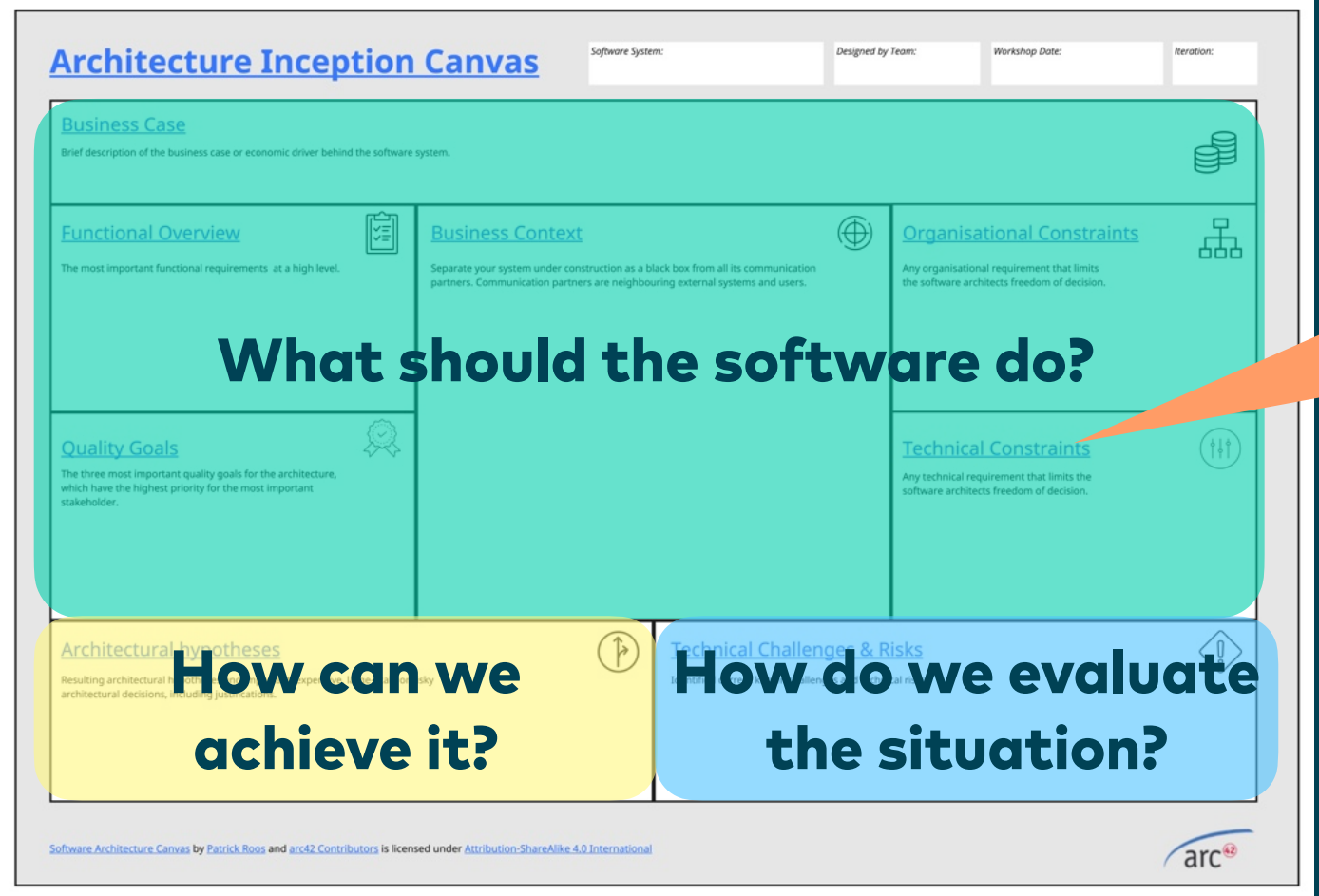
create our own canvas?

Software Architecture Canvas

Oh, snap!!

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

Thanks, Patrick!



for
new systems

https://canvas.arc42.org/architecture-inception-canvas

Agenda

ACC

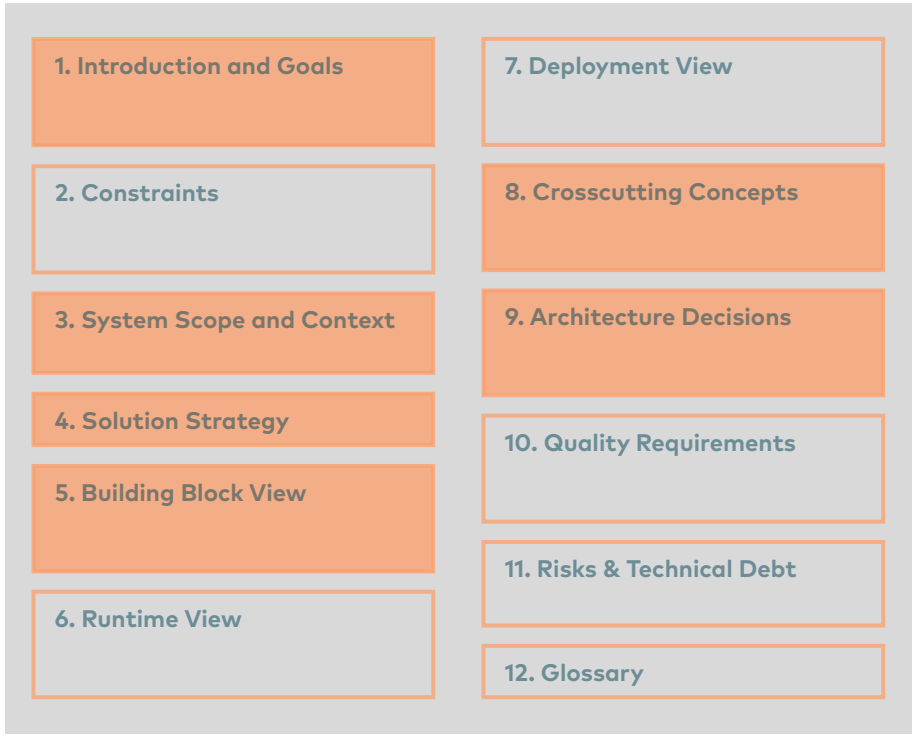
arc42 in a nutshell

What is a Canvas?

Document less, but clever!

arc42 has 12 “shelves”

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

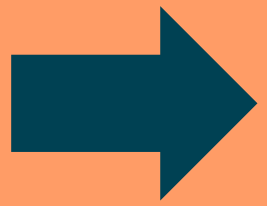
8. Crosscutting Concepts

→ Cross-cutting concepts, highly detailed

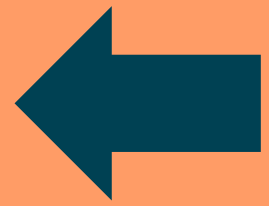
9. Architecture Decisions

→ Important architecture decisions, incl. decision makers and date

Agenda



ACC

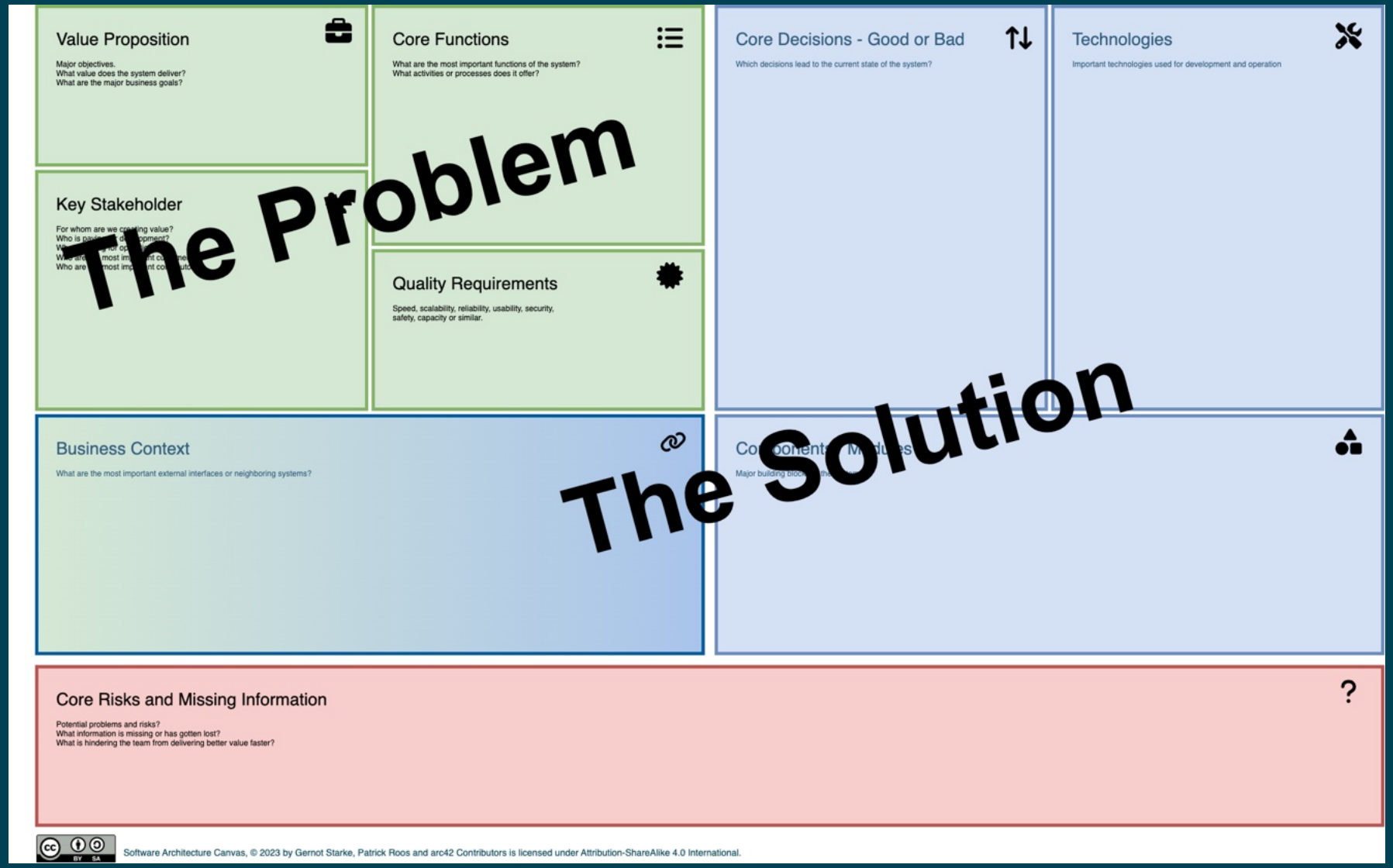


arc42 in a nutshell

What is a Canvas?

Document less, but clever!

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 Canvas for: Reviews

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

Use Canvas to: Kickstart

- Fastest possible start
- Avoid blank-paper syndrome

Use Canvas in: an Emergency

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

ACC

Examples

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

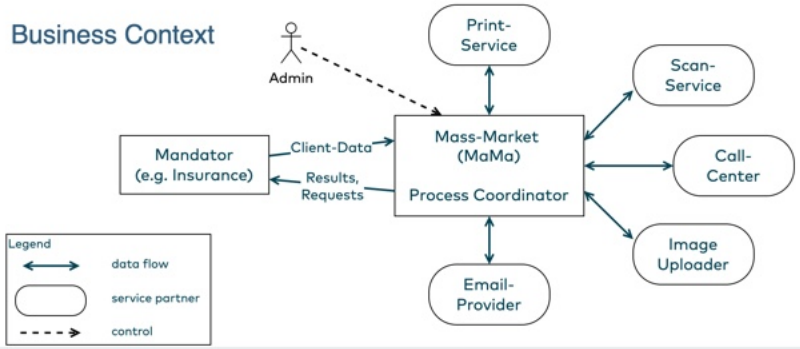
Key Stakeholder

- 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

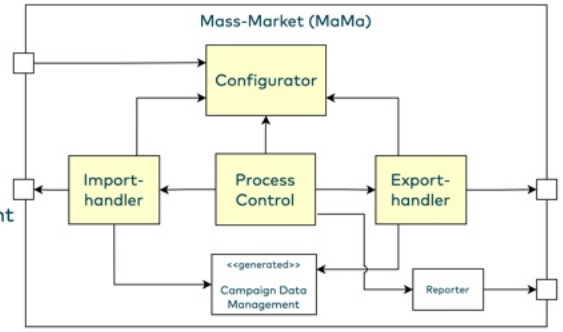
1. Strict separation of tenant data
2. New data always processed until end of business day

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:
gehalt.io	Ben Wolf	Dev Team	5. Feb 2025 / 3

Value Proposition

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

Core Functions

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

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)

Key Stakeholder

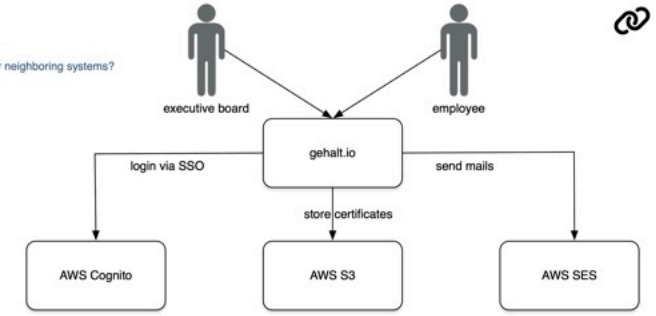
- Executive Board
- Back office
- Employees

Quality Requirements

1. Project members can easily be exchanged (Maintainability)
2. An INNOQ employee must not see someone else's info (Security)
3. The software is available during staff appraisals (Reliability)

Business Context

What are the most important external interfaces or neighboring systems?



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

Architecture Communication Canvas

system: https://status.arc42.org

date / iteration: Nov. 2023

Value Proposition

Show detailed aggregate statistics of visitors and pageviews of all arc42 websites.

Key Stakeholder

- arc42 comitters
- users of arc42 website(s)
- web developers

Core Functions

- show detailed statistics for every arc42 website (.de, .org, docs, faq, canvas, quality and status)
- show issues/bug counters

Quality Requirements

- accurate results
- simple visualization
- all relevant data at a glance

Core Decisions - Good or Bad

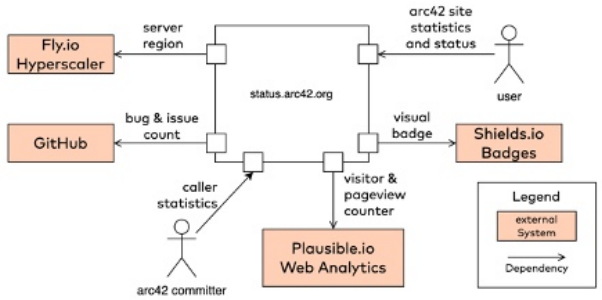
+ static site generator (Jekyll, Github pages) for main site
+ use https:// plausible.io to collect usage data
+ use fly.io for deployment
+ use Golang to wrap statistics service

− just ONE slow request to create HTML table (>3500ms)

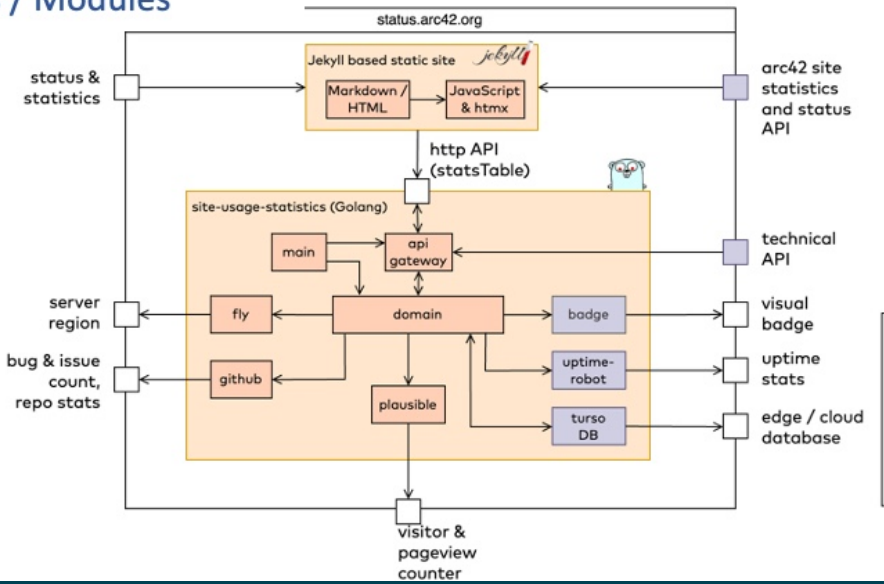
Technologies

- Markdown + plain HTML
- Golang with packages
  - net/http, http/template
  - zerolog
- htmx to perform DOM manipulation at runtime
- fly.io for deployment

Business Context



Components / Modules

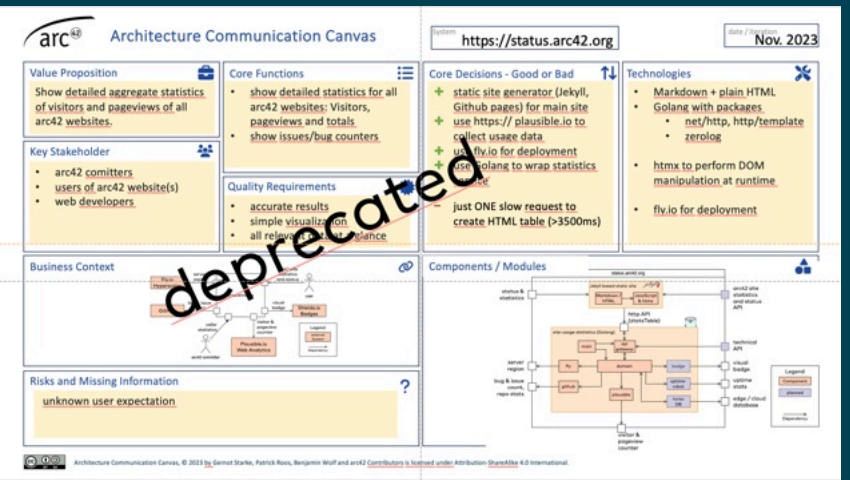


Risks and Missing Information

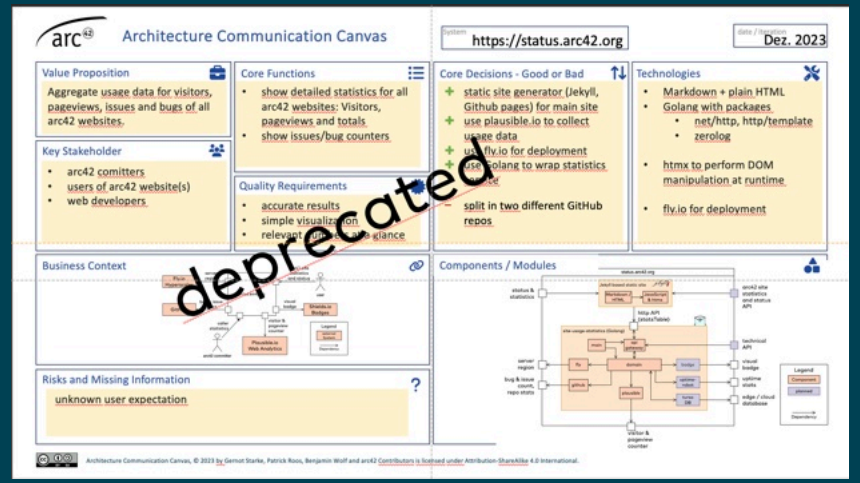
unknown user expectation

„Evolution"

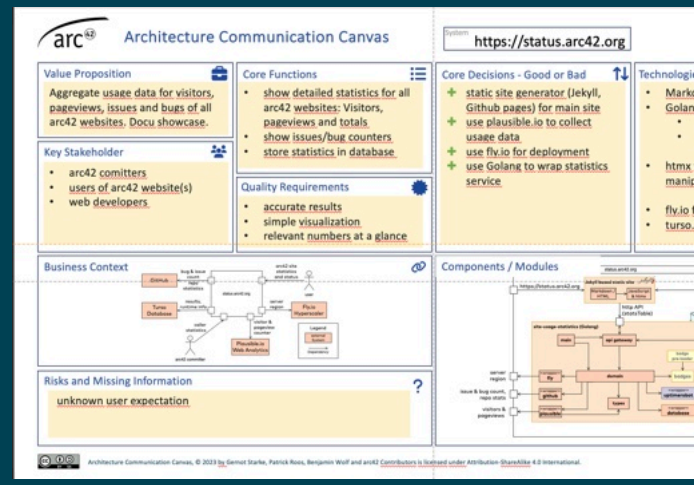
November 2023



Dezember 2023



Januar 2024



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

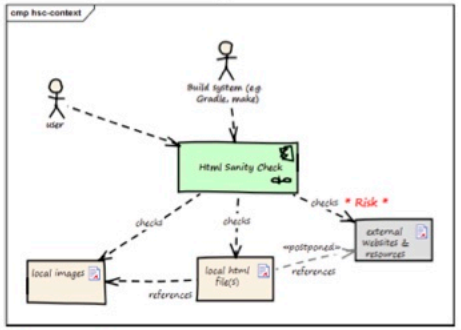
authors

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

Quality Requirements

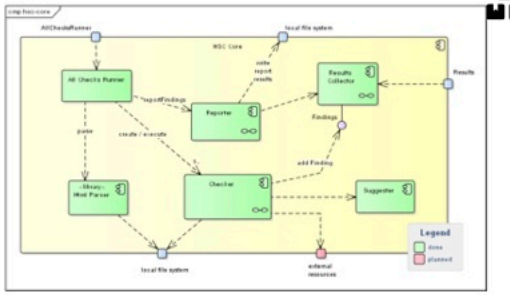
- no source document is ever changed
- all missing links/resources are found
- performance comparable to unit tests (< 1sec)

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)

„DANCIER" Open Source

Architecture Communication Canvas

System: Dancier | Created by: Team Dancier | Created for: | Date / Iteration: does not matter

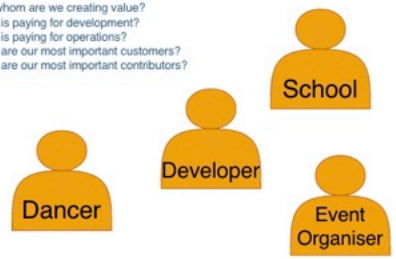
Value Proposition

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

- Provide an online community for dancers.
- Dancers can find dance partners online (e.g. for participating in dance courses together)

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?



Core Functions

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

- Connect Dancers with other dancers
- Connect Dancers with schools, events
- Dancer: Being presented with other dancers, find out if they can be their next dance partner.
- School: Promote courses and events
- Dancer: Communicate with other dancers, share information in a community

Quality Requirements

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

- Reliable
- Learning Project
- Easy to use
- Attractive Team
- Good recommendations

Core Decisions - Good or Bad

Which decisions lead to the current state of the system?

- Spring Boot Microservices for the backend
- Angular SPA for the frontend
- Built own solution for Authorization / Authentication
- Kikeriki as Self Contained System
- Docker build artefacts run on a hosted Server/VM
- Recommendation as Self Contained System

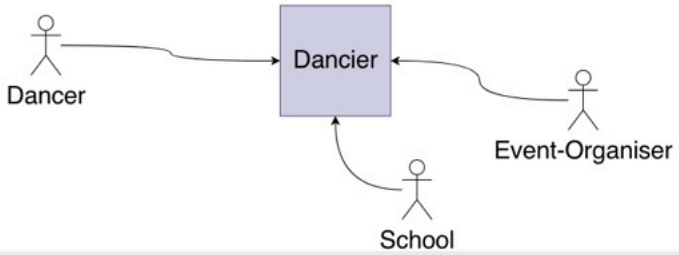
Technologies

Important technologies used for development and operation

- S3
- Kubernetes
- Angular
- PostgreSQL
- Docker
- Java
- Python
- Kafka

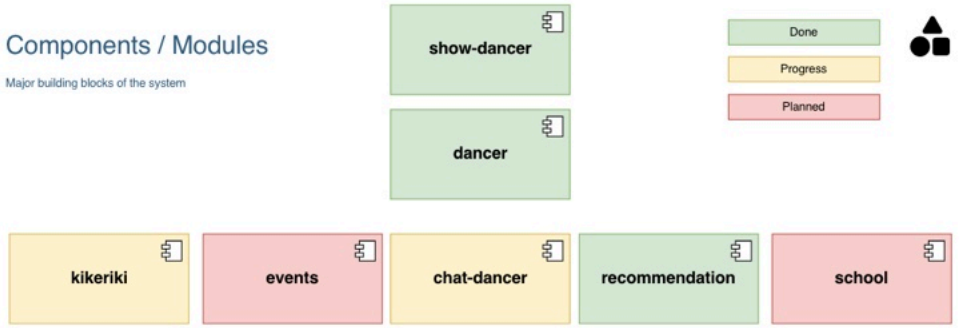
Business Context

What are the most important external interfaces or neighboring systems?



Components / Modules

Major building blocks of the system

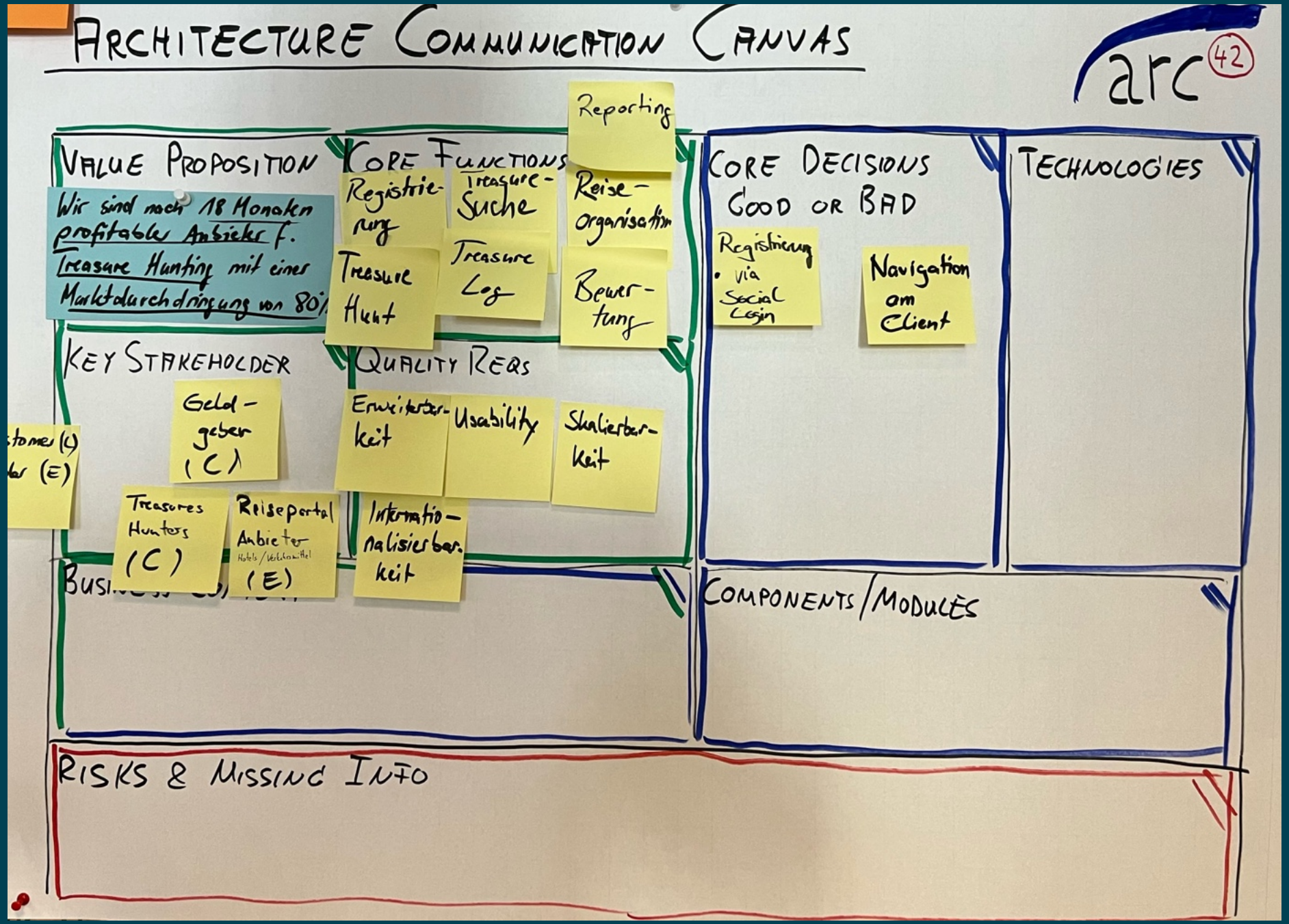


Core Risks and Missing Information

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

- Potential Overengineering
- System delivers most value if "critical mass" of dancers use it
- Adoption of Dance Schools pretty much unclear.
- Potential Spam by schools/dancers

https://canvas.arc42.org


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

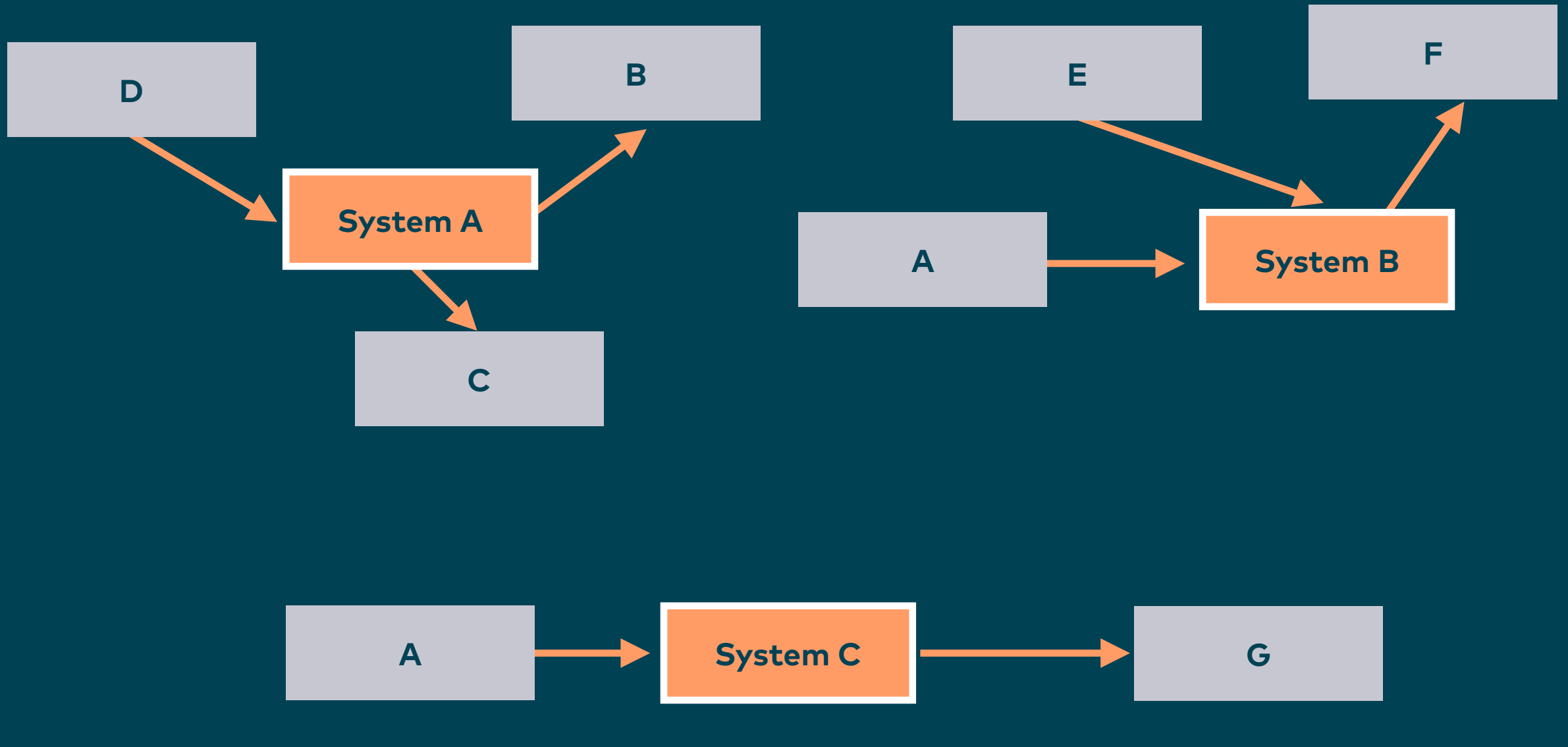
Real Talk

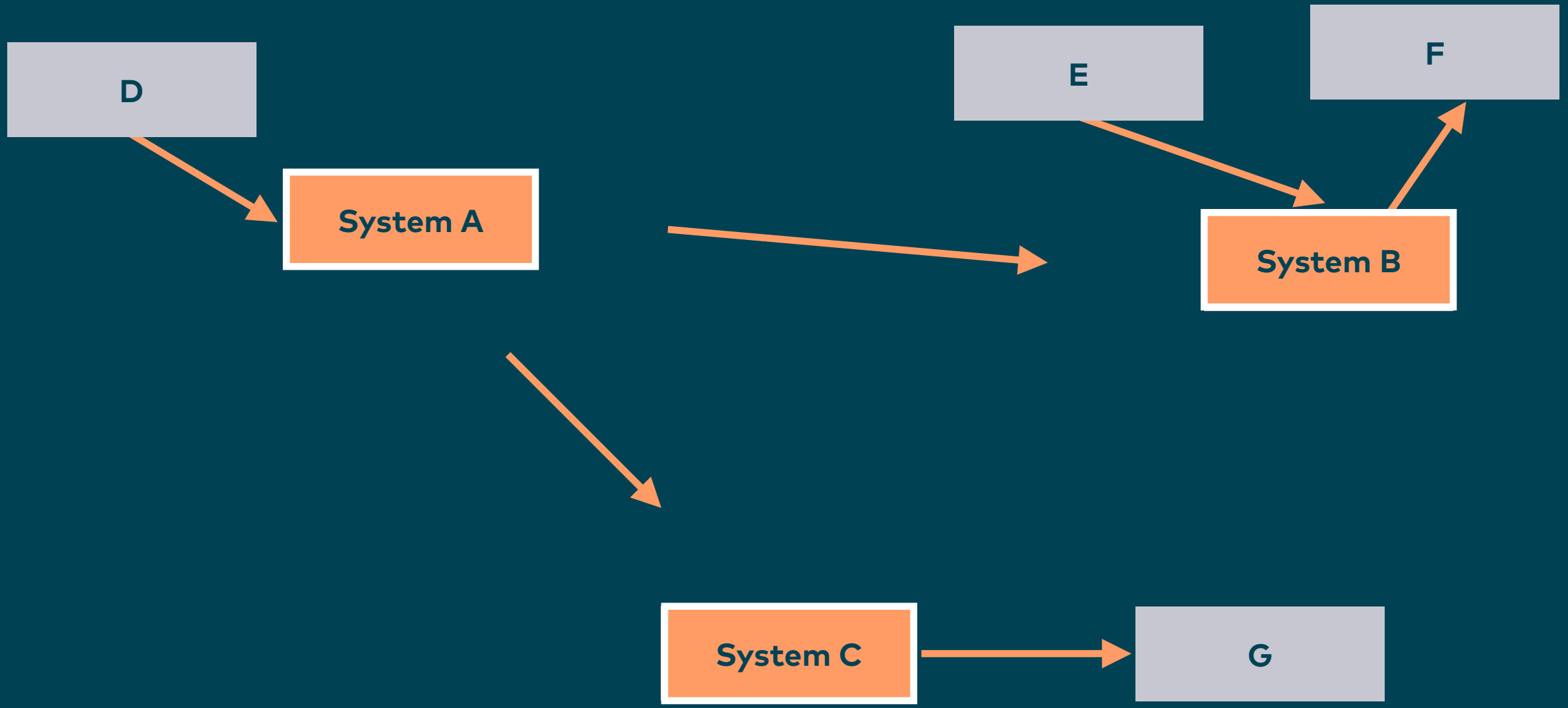
lower effort than other approaches

- Valuable documentation in < 2 hours!
- Aha moments!
- Lost treasures! Fun!!
- Getting started with documentation!

well-invested 90 minutes

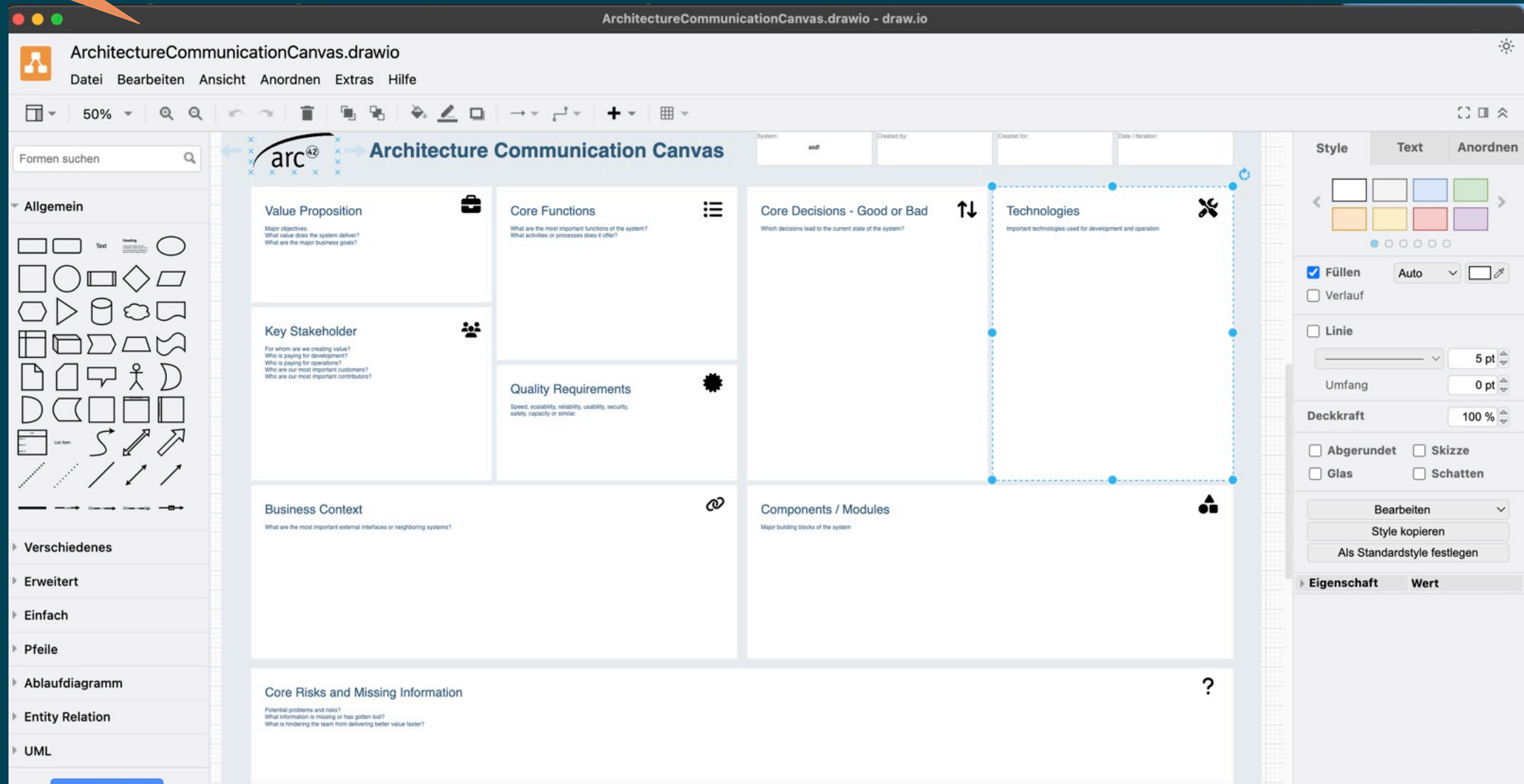
With ACC, I was well-prepared


D
B
System A
C
E
F
A
System B
A
System C
G


D
E
F
System A
System B
System C
G

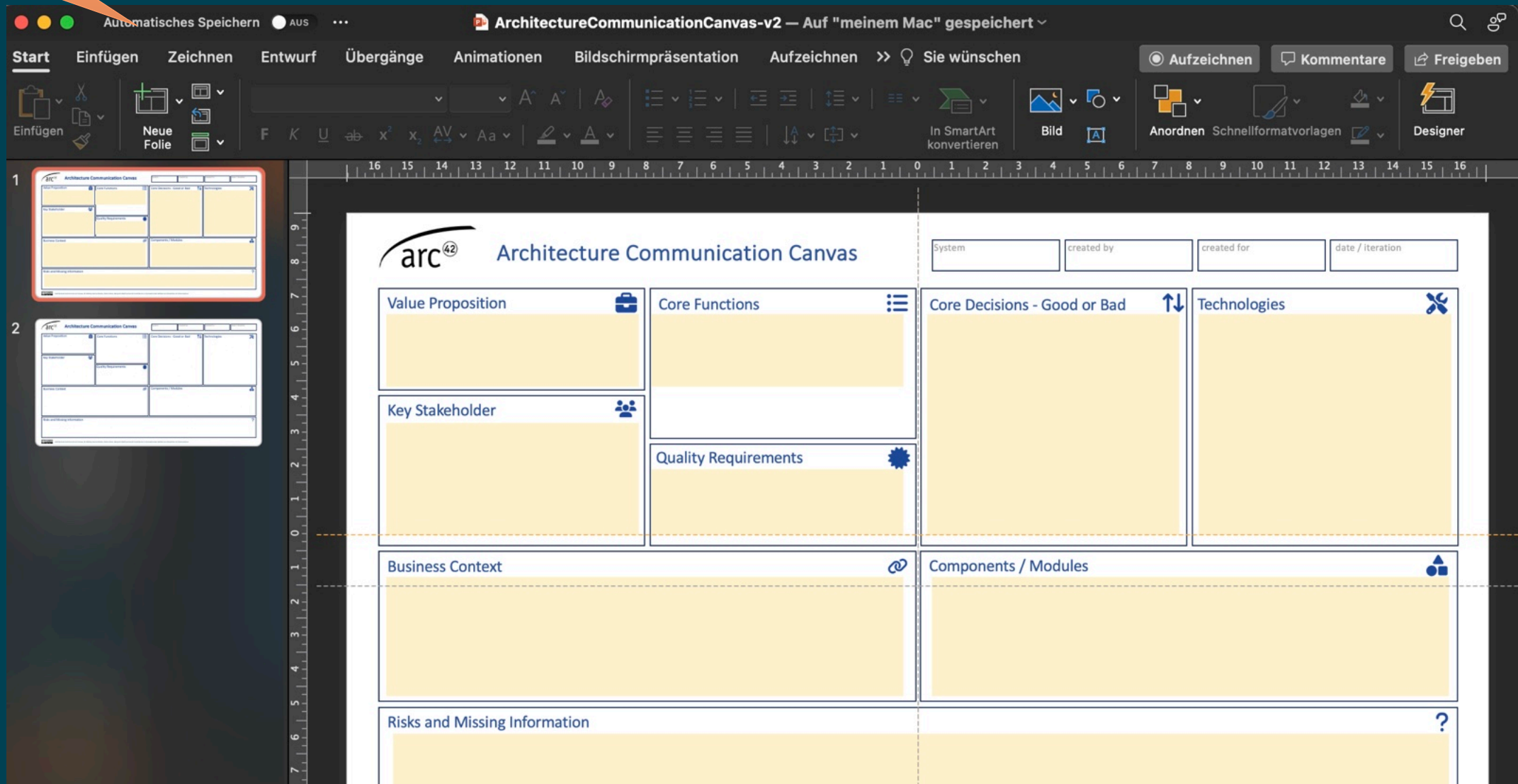
draw.io,
diagrams.net

Tooling (1)



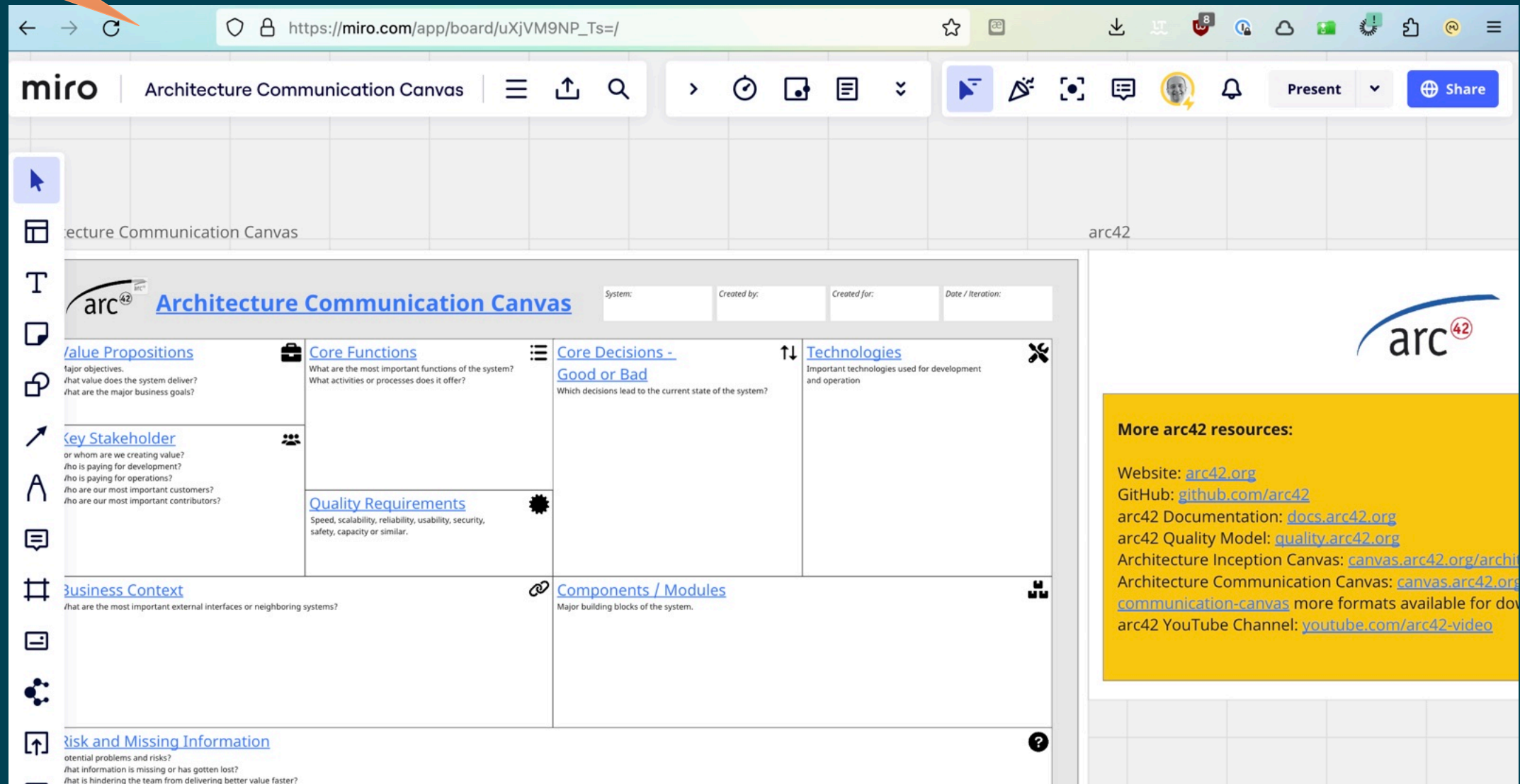
pptx

Tooling (2)



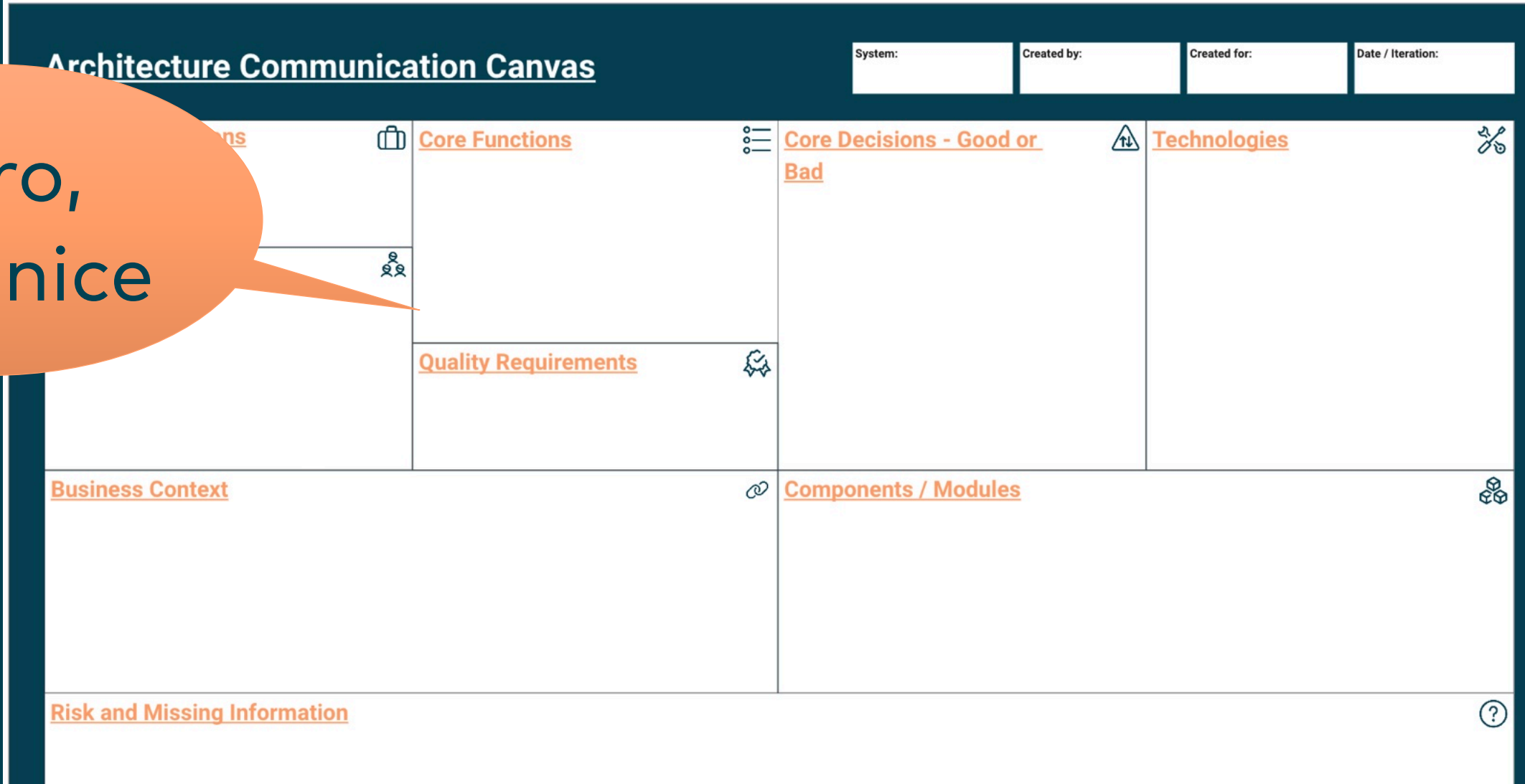
Tooling (3)

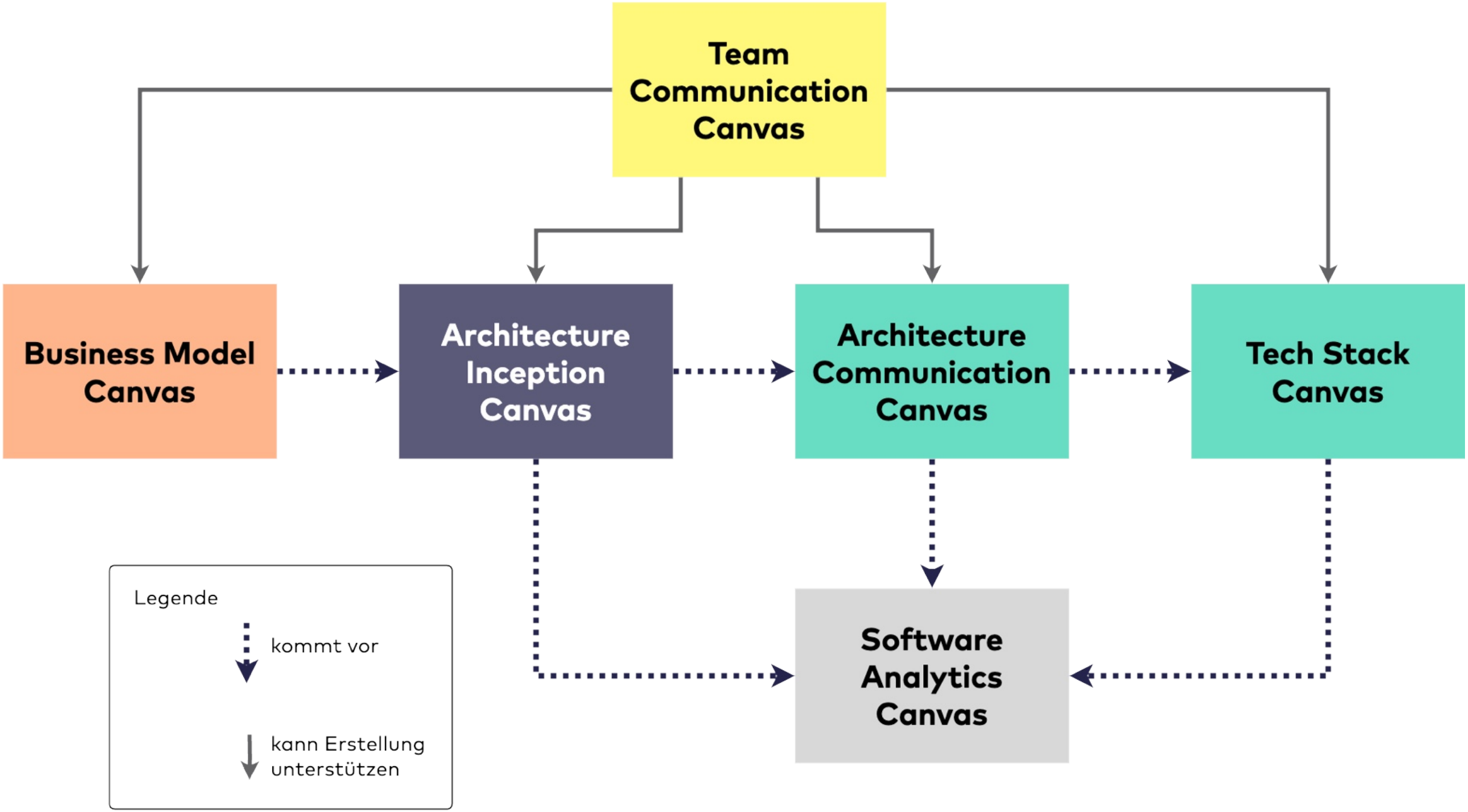
Miro

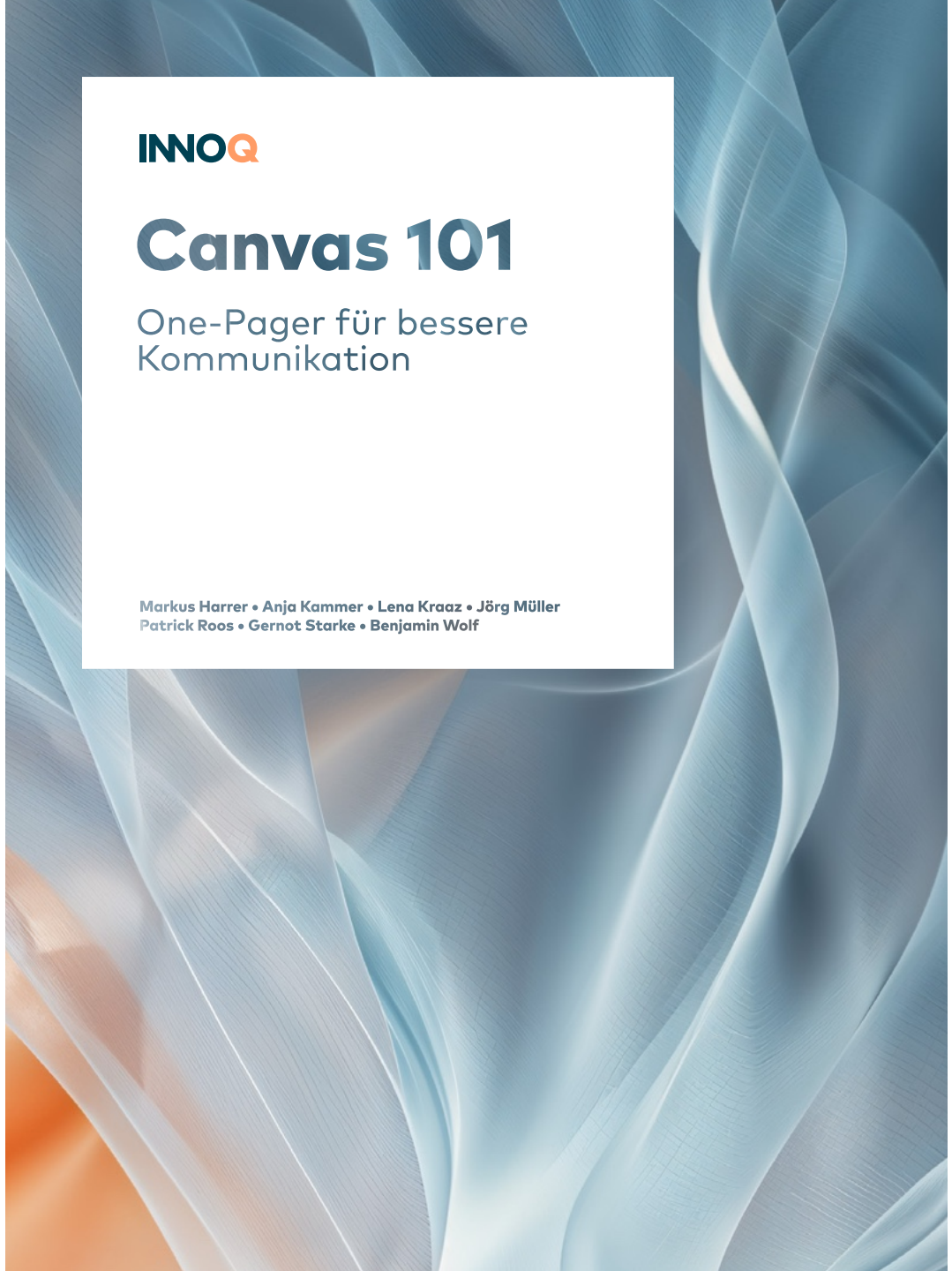


Tooling XL

Miro,
very nice




Team Communication Canvas
Business Model Canvas
Architecture Inception Canvas
Architecture Communication Canvas
Tech Stack Canvas
Software Analytics Canvas
Legende
kommt vor
kann Erstellung unterstützen



SIEBEN

- verschiedene Canvas-Ansätze
- von sieben Expert:innen erklärt

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