

Kontext-Kleber für den KI-Kosmos

Wie konsistentes Wissen KI-Assistenten
im Software-Lebenszyklus verbindet

Markus Frank,
David Götze,
Raynhold Schapp



Who we are!



David Götze

Senior Solution Architect

He is passionate about how complex **requirements** can be transformed into clear, robust **software architectures**. He specializes in modern **e-commerce** solutions and **data platforms** and helps companies develop **scalable systems** that are sustainable in the long term and strategically adaptable.



Dr. **Markus** Frank

Lead Solution Architect

His focus is on data-driven, cloud-native platforms designed for high user volumes, as well as AI-supported and AI-driven software solutions. In addition, he specializes in modern testing strategies and **performance testing**. He helps companies develop **scalable** systems that are technically robust, sustainable in the long term, and **strategically** adaptable.



Raynhold Schapp

Software Architect

At heart, he is still a **software engineer**, which is why he enjoys taking a good look at the **code**.

His focus is on the **continuous improvement** and **observability** of existing systems—with the goal of developing long-lasting software that evolves over time.

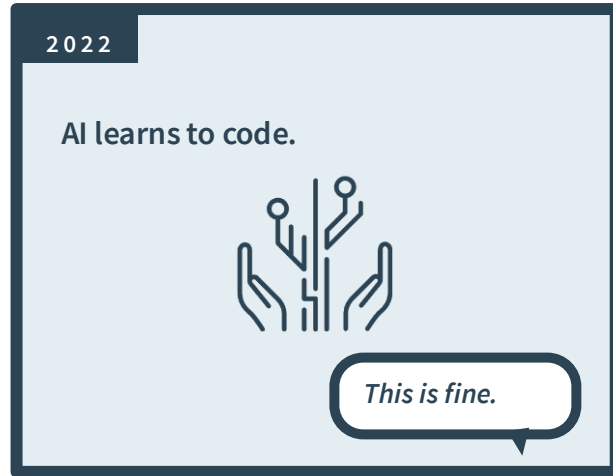


Why we are here!

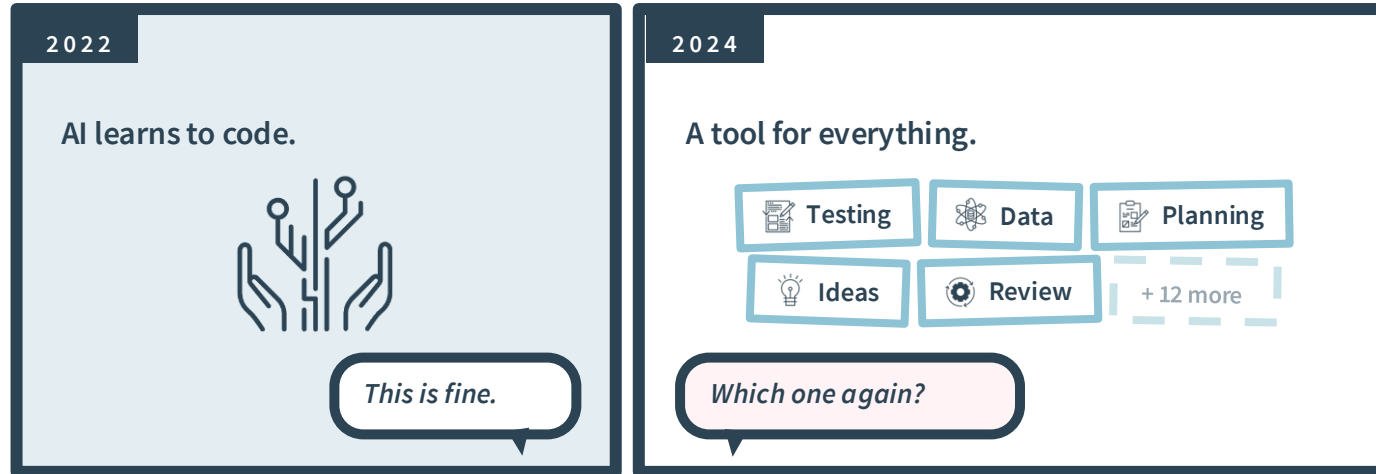
Story Time



Long **Story** short



Long **Story** short



Long **Story** short

2022

AI learns to code.



This is fine.

2024

A tool for everything.

Testing

Data

Planning

Ideas

Review

+ 12 more

Which one again?

2026

Prototypes in an afternoon.



Ship it!



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...but nothing shipped.

- ✗ Prototypes stayed prototypes
- ✗ Nobody understood the code
- ✗ Twelve tools, zero glue
- ✗ Benefit still unproven

Without a shared **context**, every **AI tool** remains an isolated **experiment**.



Long **Story** short

2022

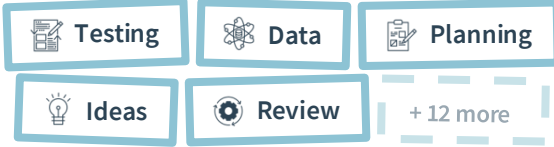
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CRUNCH!

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NOW

Method beats tooling.

- The whole life cycle
- Approaches, not tools
- Human in the loop

TO BE CONTINUED →



What to **Expect** Today

A practical field report - not a universal blueprint

Without a shared **context**, every **AI tool** remains an isolated **experiment**.

WHAT WE WILL DO

- 01 Show AI **opportunities** across the SDLC
- 02 Creating and managing a **shared knowledge base** for AI
- 03 Utilize context for **improved** results and advanced tasks

WHAT WE WILL NOT DO

- 01 Provide a **scientific** evaluation or universal best practice
- 02 Deep-dive into **coding agents** or compare individual tools
- 03 Define an **AI Factory** architecture or implementation guide

Approaches over tools; **Context** as foundation; **Human** in the loop



What are our **Challenges**

A practical field report - not a universal blueprint



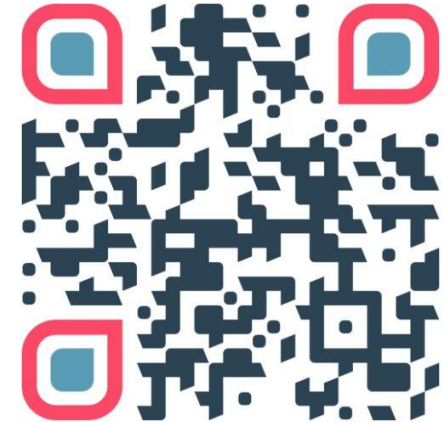
Avantgarde Labs

Avantgarde Labs GmbH

~50 employees

No product — project business for our customers

Every project comes with its own requirements



**Programming
languages**

**Frameworks &
technologies**

**Setups &
team models**

**Documentation
styles**

Knowledge management &
universal guidelines are tricky

Common ground:
Software Development **Life Cycle**

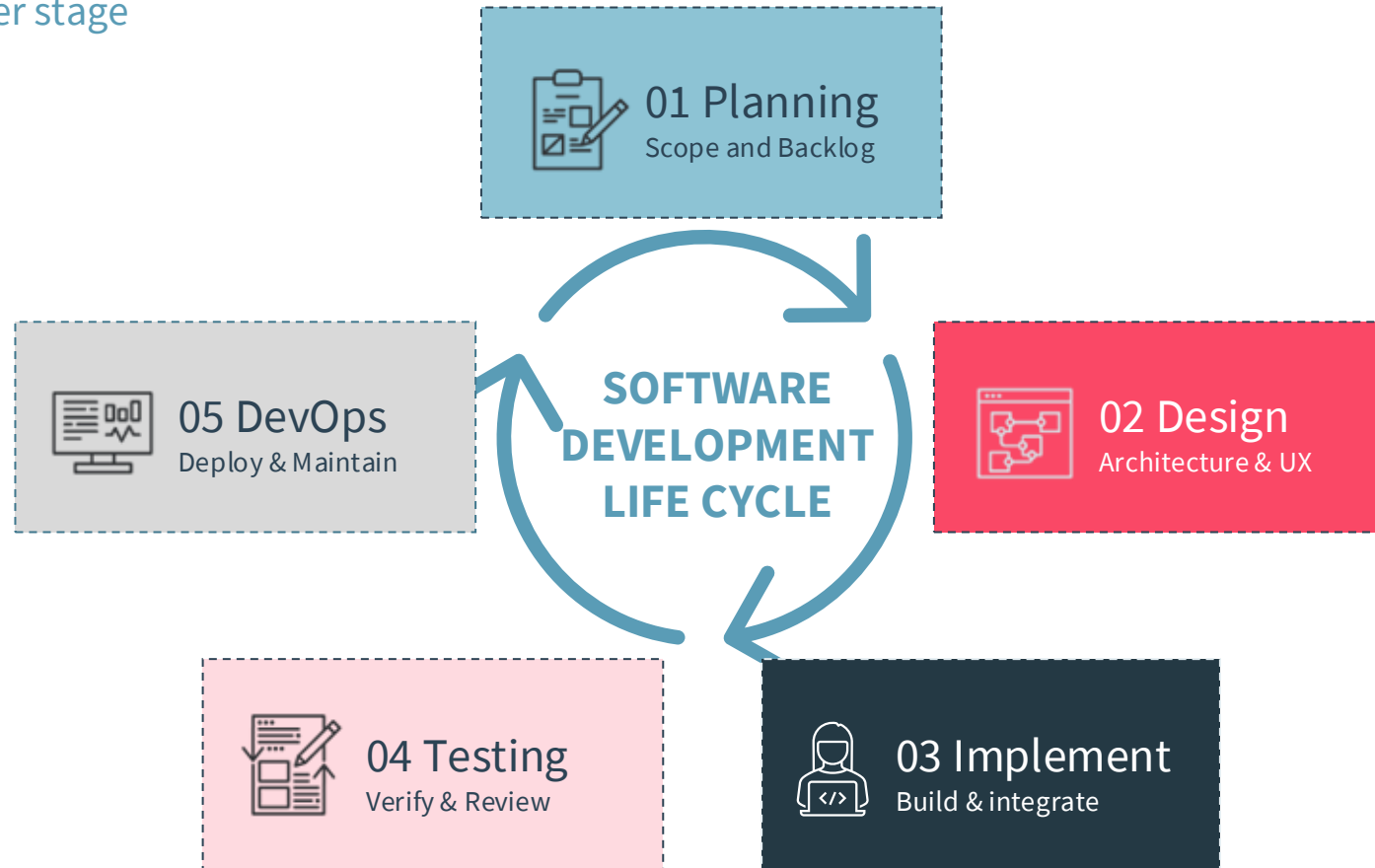


Software Development Life Cycle



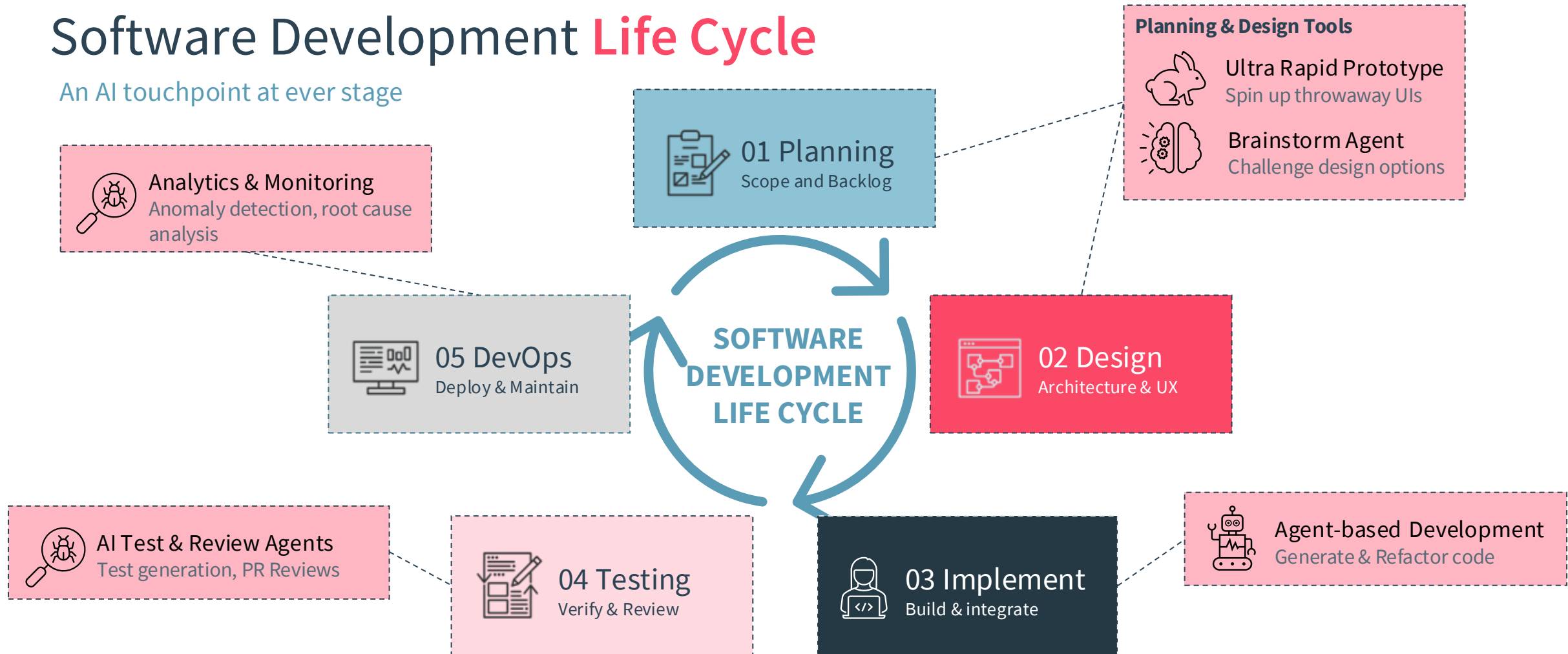
Software Development Life Cycle

An AI touchpoint at ever stage

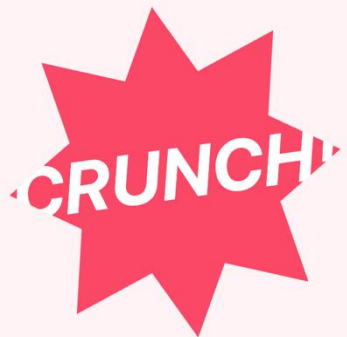
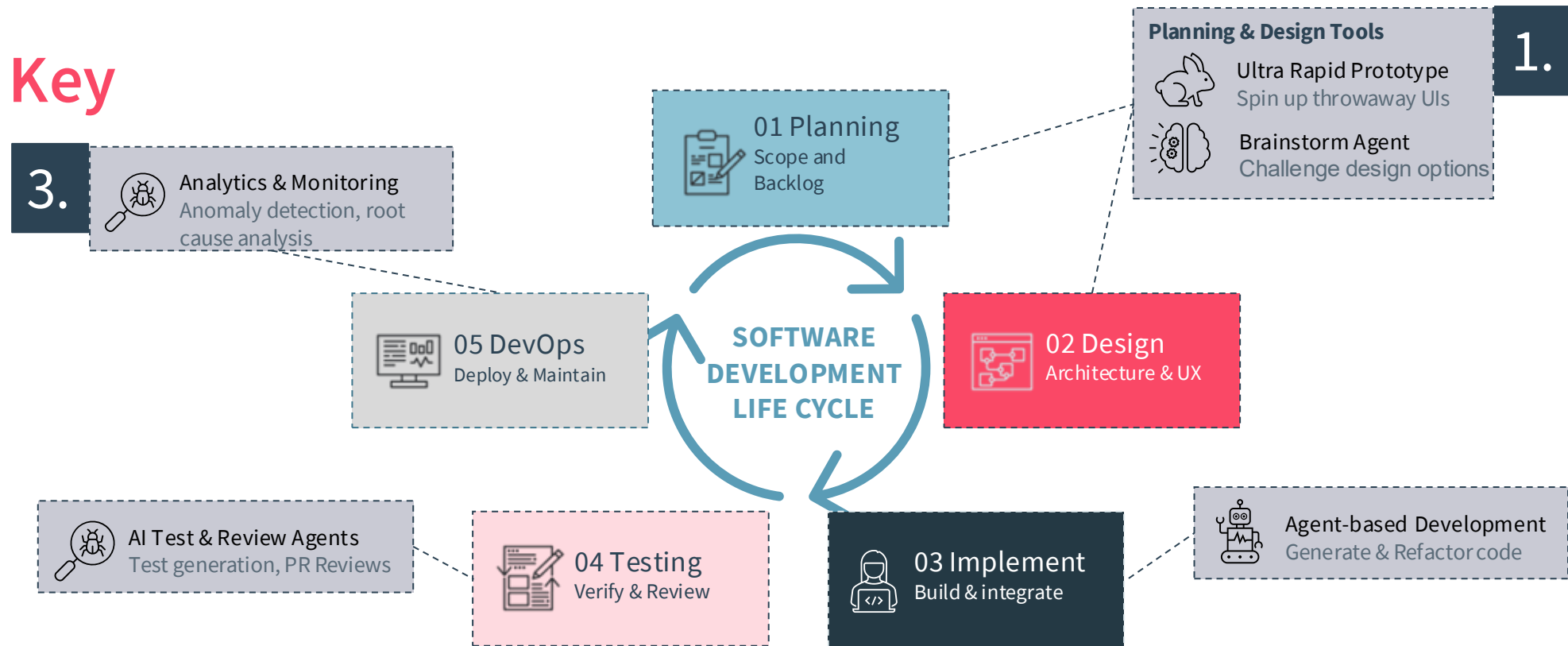


Software Development Life Cycle

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Context is **Key**



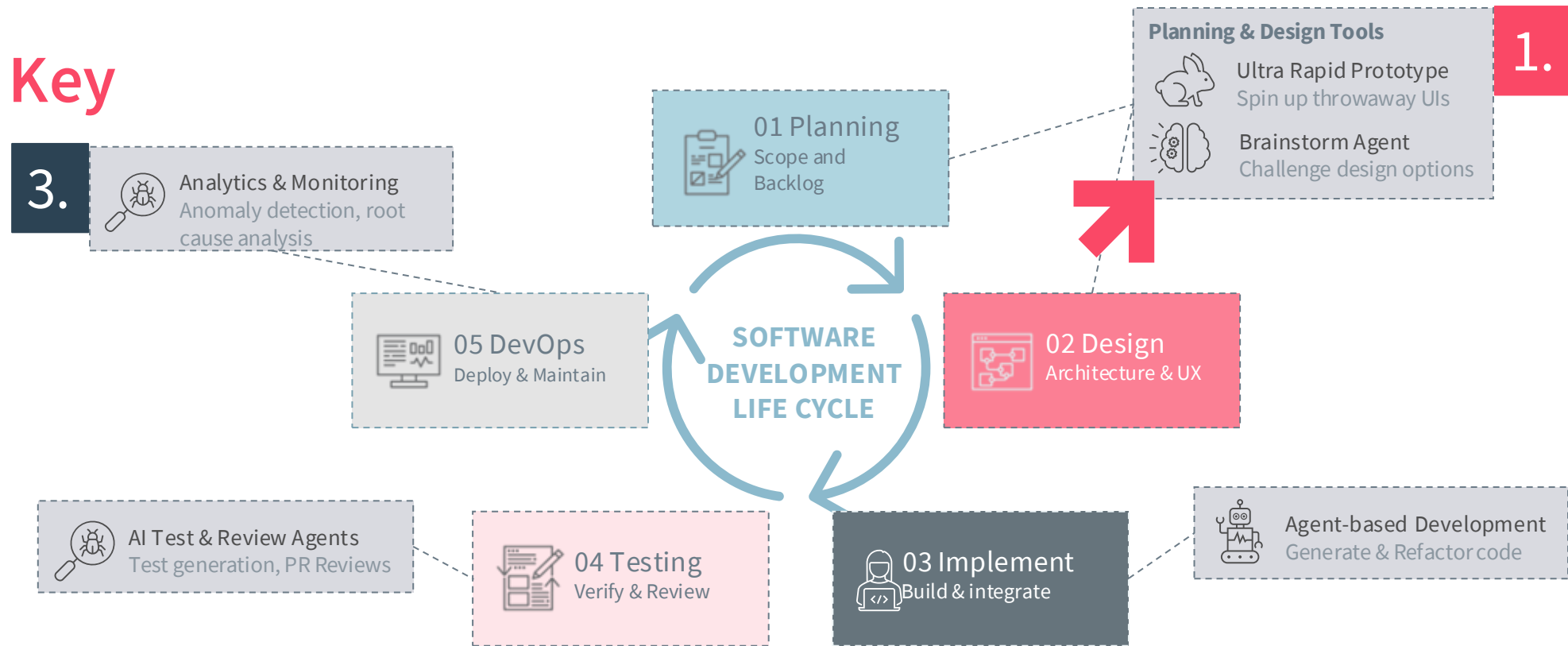
...but nothing shipped.

2.

Context as Foundation



Context is Key



2.

Context as Foundation



CONTEXT

From Data to **Knowledge**



From Data to **Knowledge**

Each step adds structure and context to the raw project material



Meetings



eMails



Documents



Presentations



Code

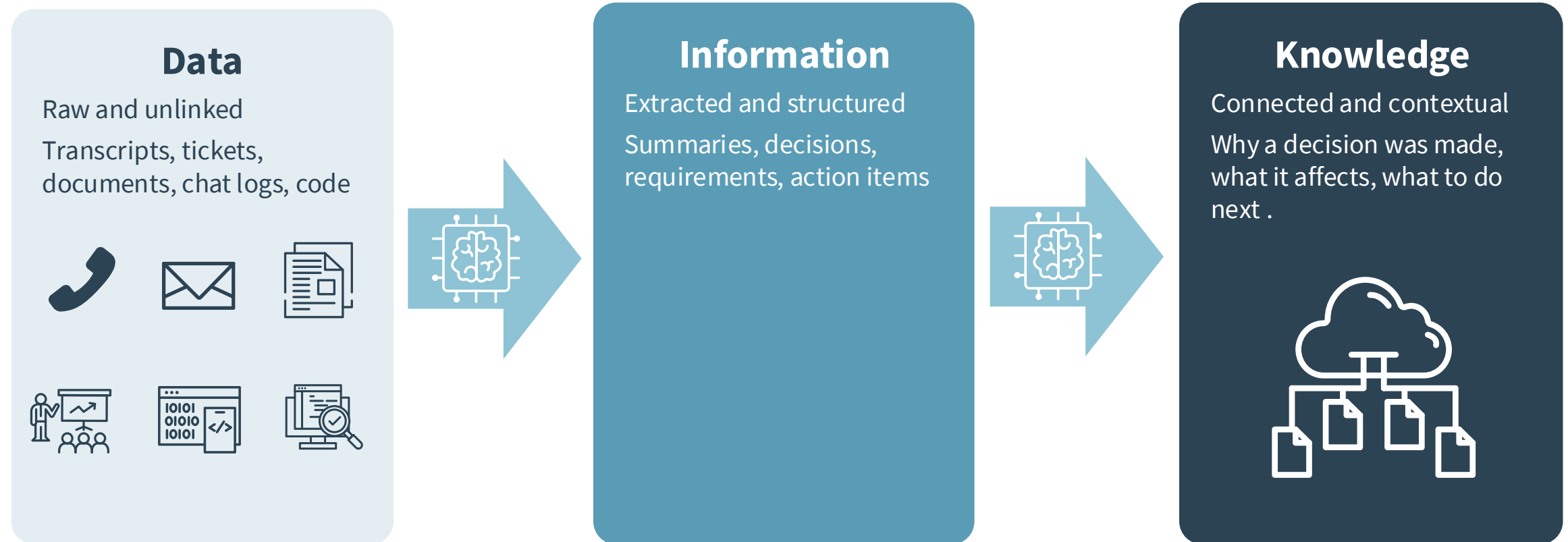


Logs & Metrics



From Data to **Knowledge**

Each step adds structure and context to the raw project material



[Source: Based on DIKW-Pyramid by Russel Ackoff: "From Data to Wisdom", 1989]



From Meeting to **Information**

Turn the transcript into structured results with AI



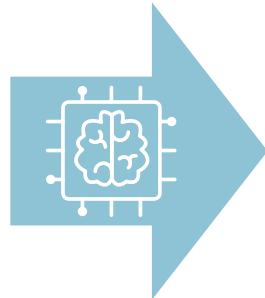
Data

Meeting Transcript

- Speakers & Timestamps
- What has been spoken

Meeting Meta data

- Participants
- Date & Time
- Agenda



Information

Executive summary

Key takeaways in a few sentence

Decisions

Agreed decisions with context and rationale

To-dos

Action items with owners and due dates

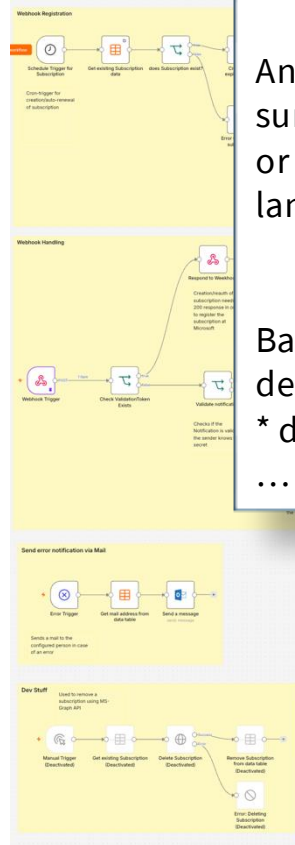


From Meeting to Information

Turn the transcript into structured results with AI

Example:

- Subscribe to new transcripts via webhook
- Aggregate transcript, participants, and further meta-data of meeting
- Extract data via AI
- Further processing, e.g. creation of
 - Markdown-file
 - Confluence page
 - E-Mail to participants



Prompt

Analyze the following transcript and create a fact-based summary or outcome in German language

Based on the transcript, create a decision summary

...

2026-09-24 adhoc meeting

Participants

- Markus Frank (mfrank@avantgarde-labs.de)
- David Götze (dgoetze@avantgarde-labs.de)

Summary

Markus and David decided upon the remaining todos regarding their talk at the JUG 2026.

Decisions

- Markus and David will have a coffee directly after the talk @Markus @David
- ...



From Meeting to **Information**

Turn the transcript into structured results with AI



Data

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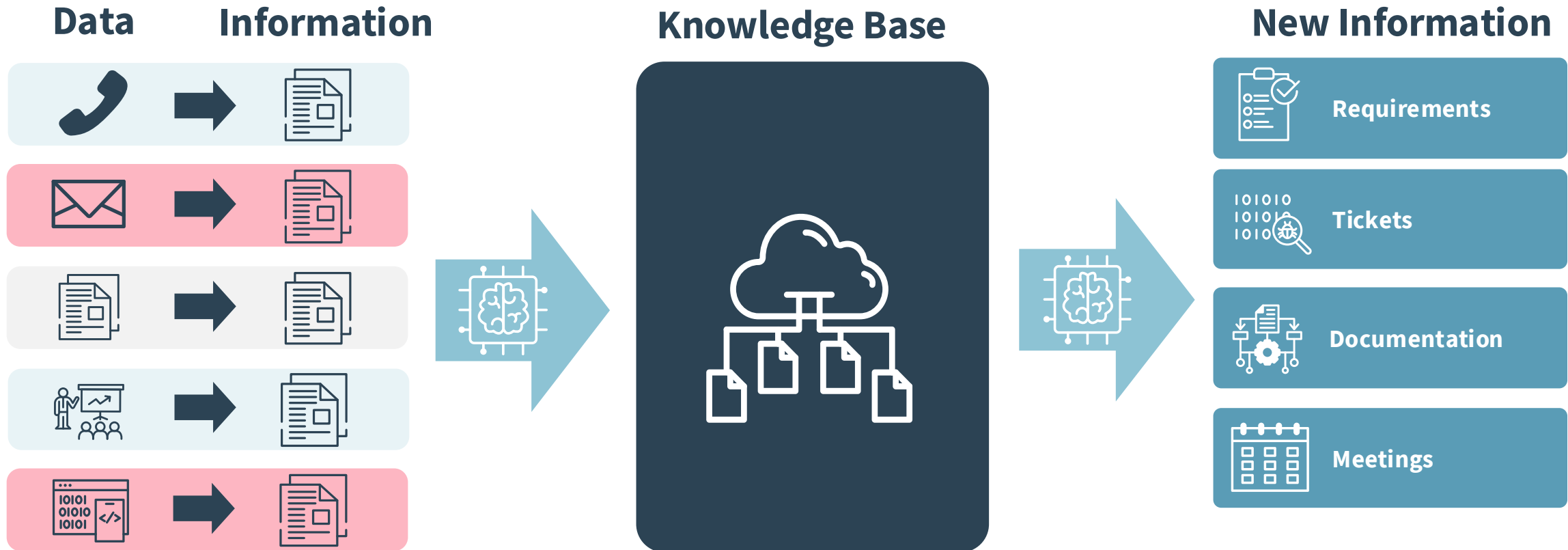
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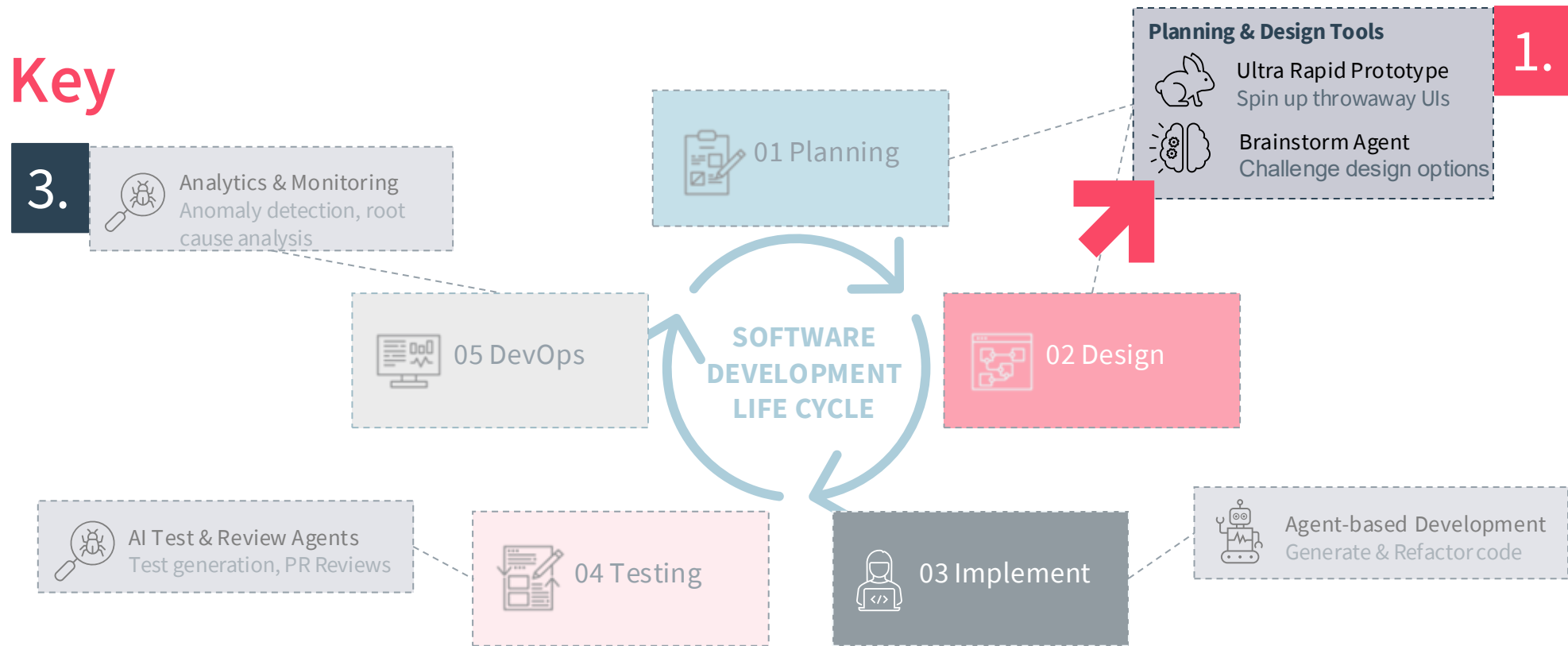


From Information to **Knowledge**

...and beyond



Context is **Key**

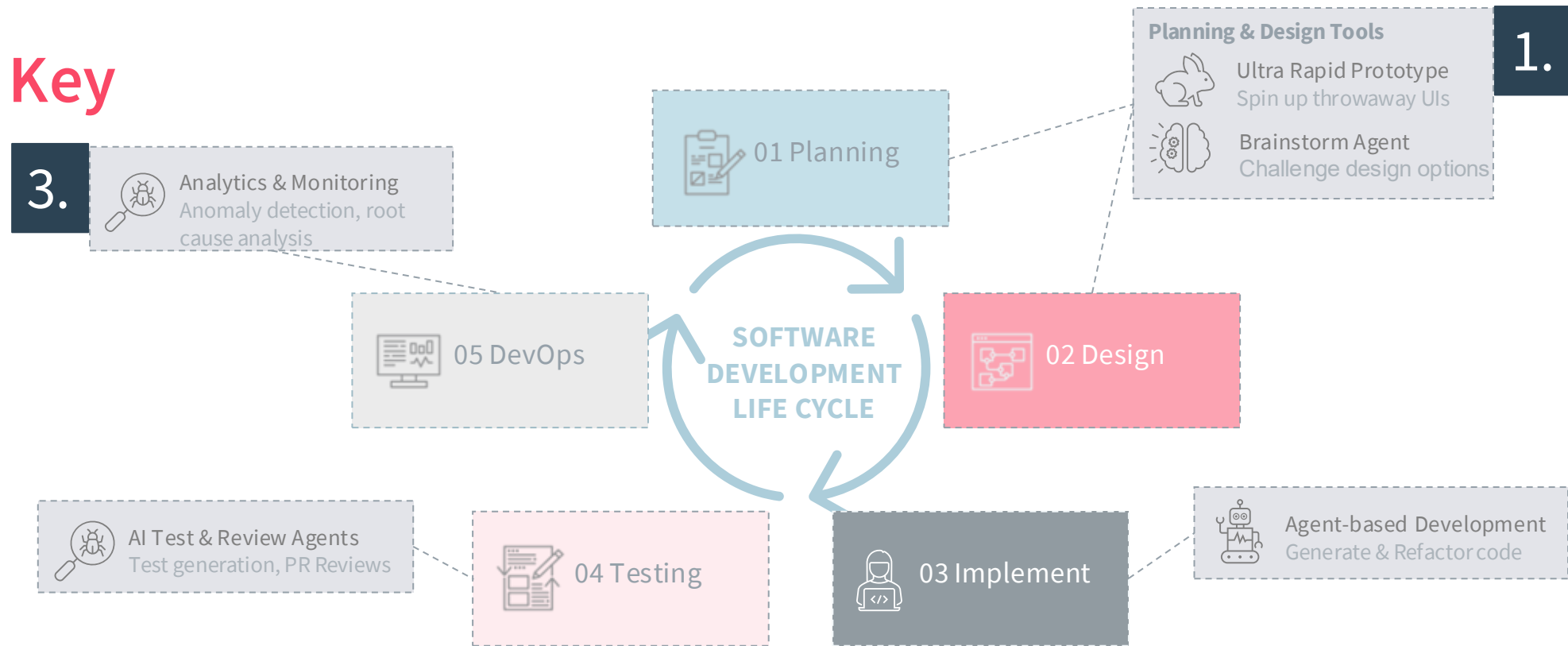


2.

Context as Foundation



Context is **Key**



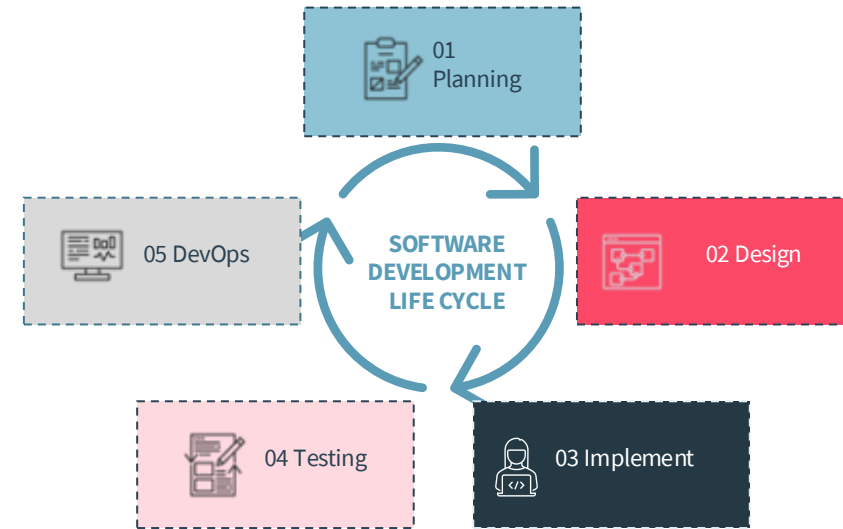
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Context as Foundation



Knowledge **Aggregation**

Store knowledge accessible for agents

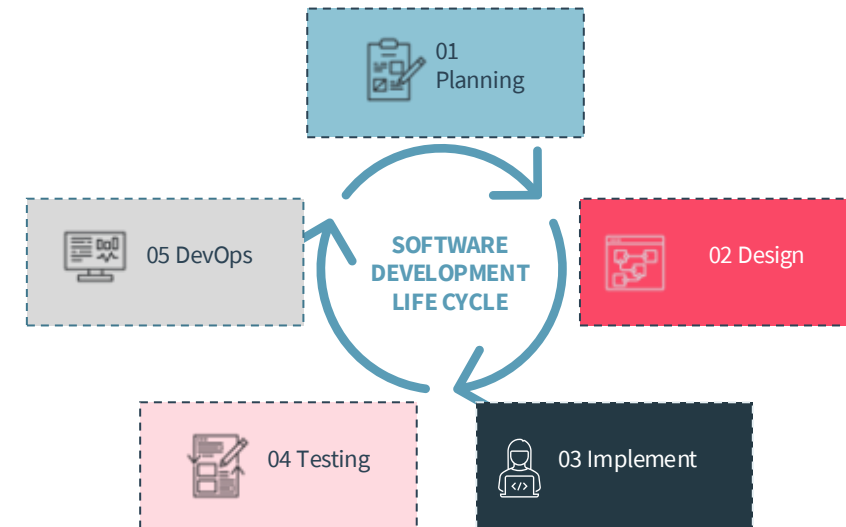


Context as Foundation



Knowledge Aggregation

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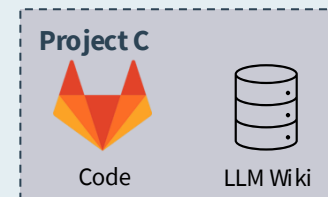
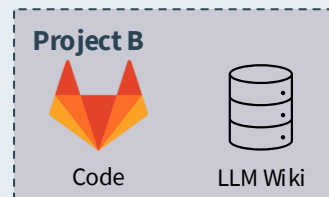
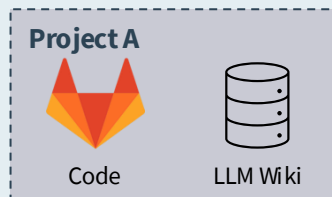


Foundation

shared LLM knowledge base
grounds every agent.

Company Knowledge Base

Agent knowledge Base

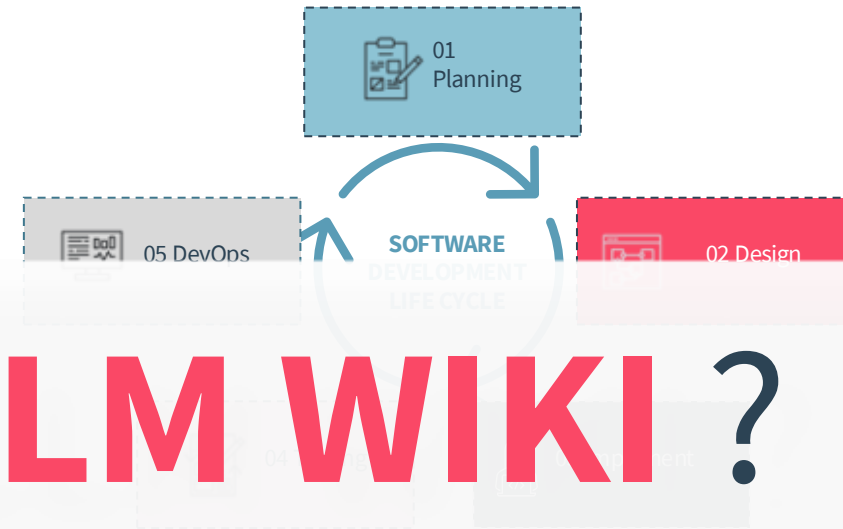


- LLM Wiki per **project**
- LLM Wiki accessible for **agents**
- **Mono Repos** simplify access
- Documentation **readable** for Devs



Knowledge Aggregation

Store knowledge accessible for agents



What is an LLM WIKI ?

Foundation

shared LLM knowledge base
grounds every agent

*An LLM wiki is a **structured**, continuously maintained knowledge base that **agents** can ingest, organize, retrieve, update, and clean to preserve **reliable context** over time.*

Company Knowledge Base

Agent knowledge base

<https://gist.github.com/karpathy/442a6bf555914893e9891c11519de94f>

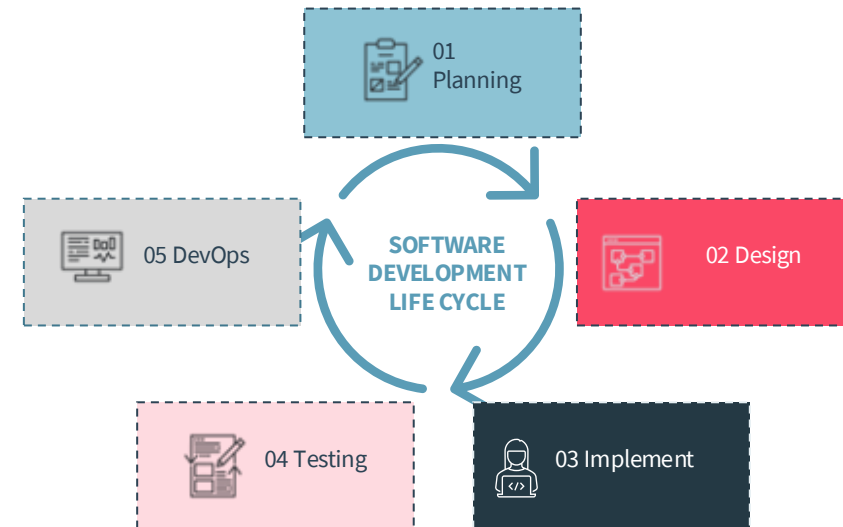


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Knowledge Aggregation

Store knowledge accessible for agents



Foundation

One shared LLM knowledge base grounds every agent.



Sheldon
Hybrid Search
Chat Agent

Retrieval-Augmented Generation

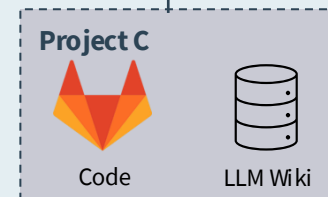
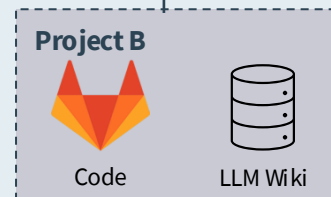
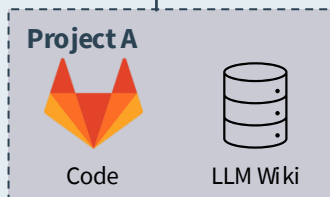


Hybrid &
Semantic
Search

Company Knowledge Base

Agent knowledge Base

Project Docs Code Guidelines
Runbooks Test Plans
Requirements ADRs



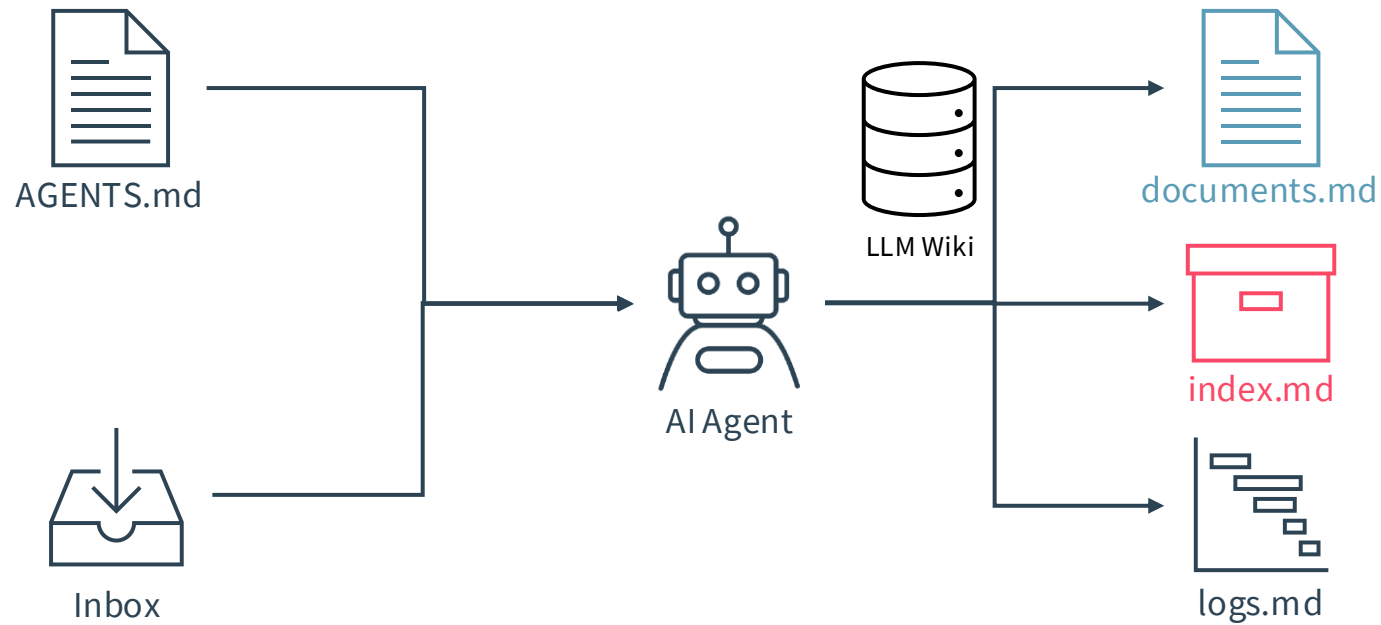
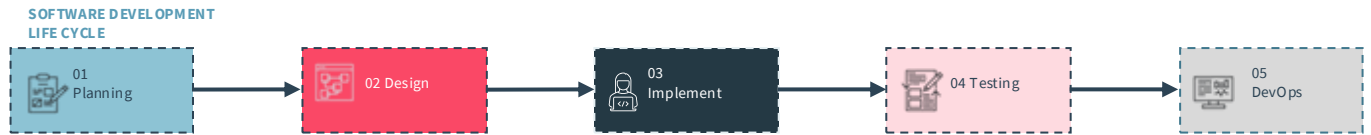
- Central **semantic** database
 - Aggregates all project content
 - **Hybrid Search** and **RAG** provides
- 💡 **Sheldon** can answer complex questions

- LLM Wiki per **project**
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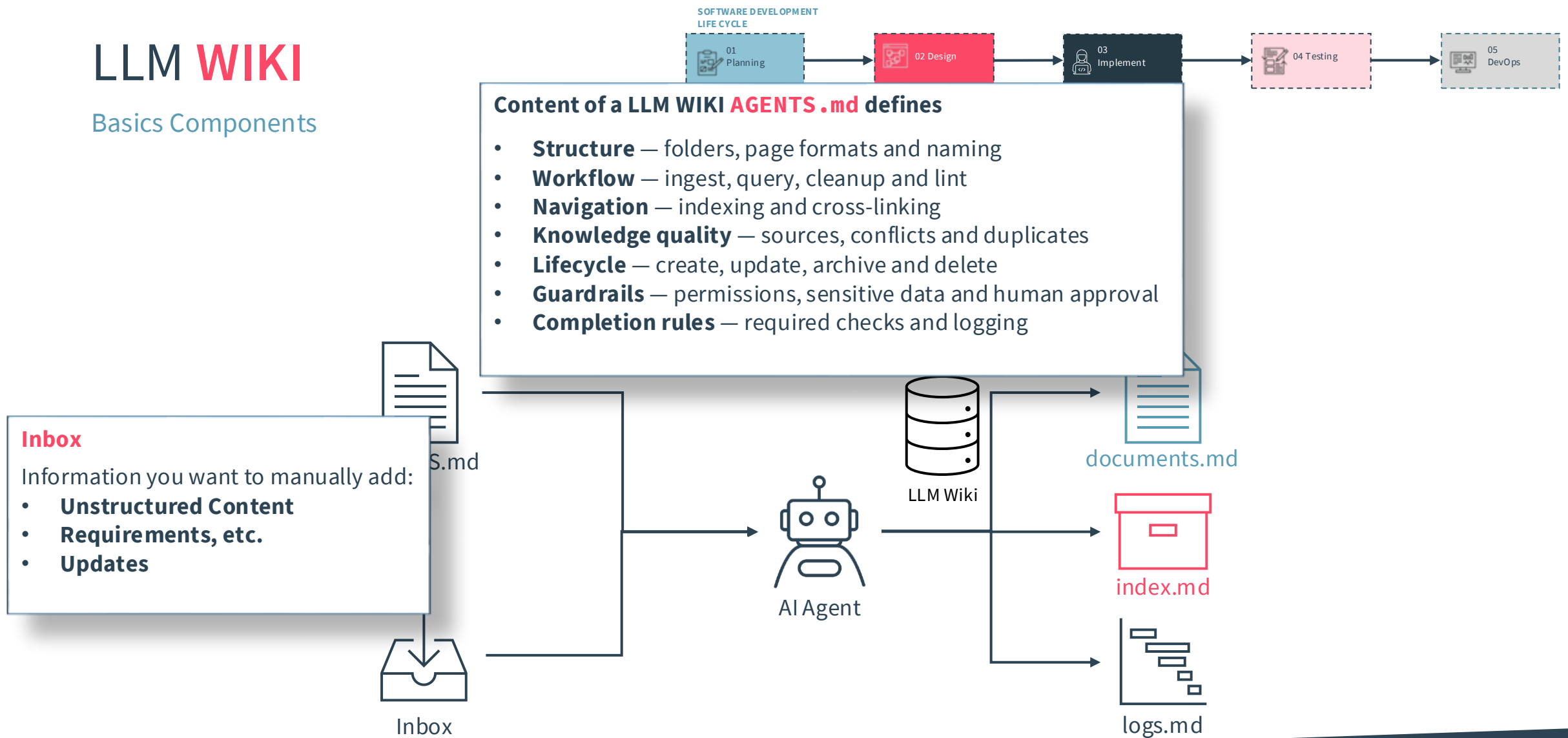
LLM WIKI

Basics Components



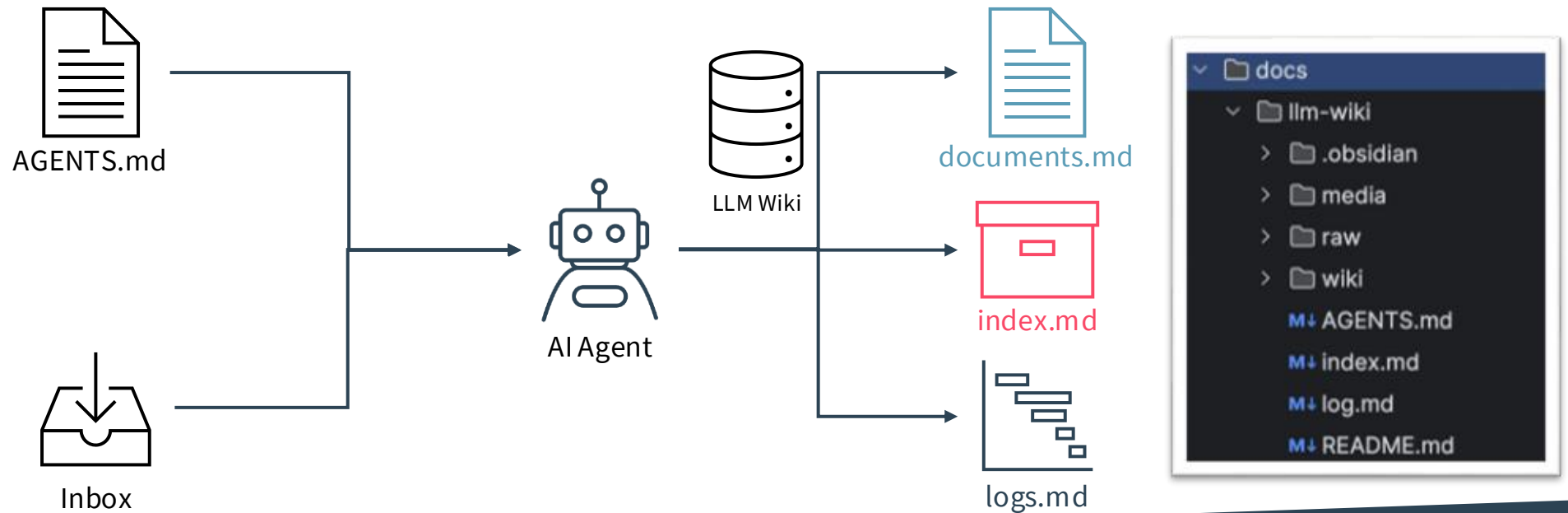
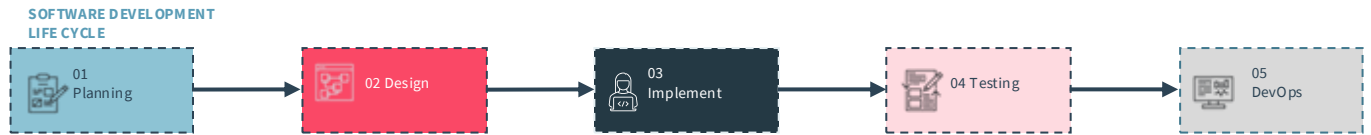
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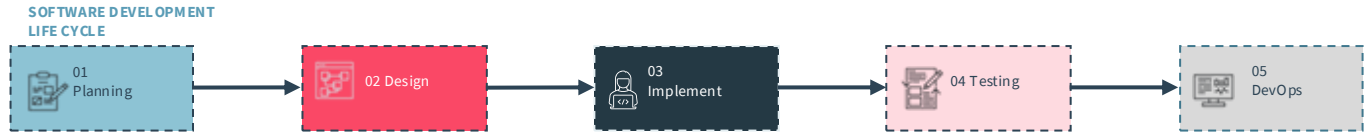
LLM WIKI

Basics Components



LLM WIKI

Basics Components



index.md

Architecture

- [[goals|Goals]] — vision and quality goals
- [[system-context|System Context]] — users and external systems
- [[system-architecture|System Architecture]] — main building blocks
- ...

Security

- [[authentication|Authentication]] — login and identity provider
- [[permissions|Roles and Permissions]] — access-control model
- [[secret-management|Secret Management]] — handling sensitive data

Decisions

- [[postgresql|PostgreSQL]] — primary database decision
- [[rest-api|REST API]] — API architecture decision
- [[monorepo|Monorepo]] — repository structure decision



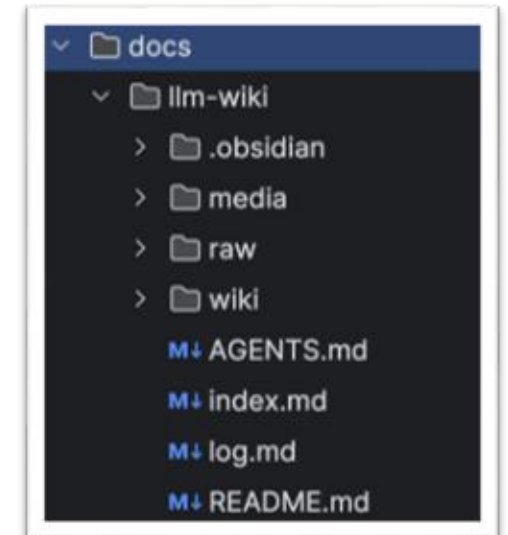
documents.md



index.md



logs.md

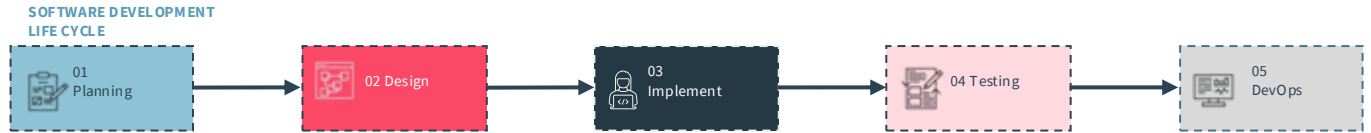


index



LLM WIKI

Basics Components



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Decisions

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- [[monorepo|Monorepo]]

log.md

[2026-07-15] ingest | architecture documents

→ Created architecture pages and updated index.md

[2026-07-15] ingest | database model

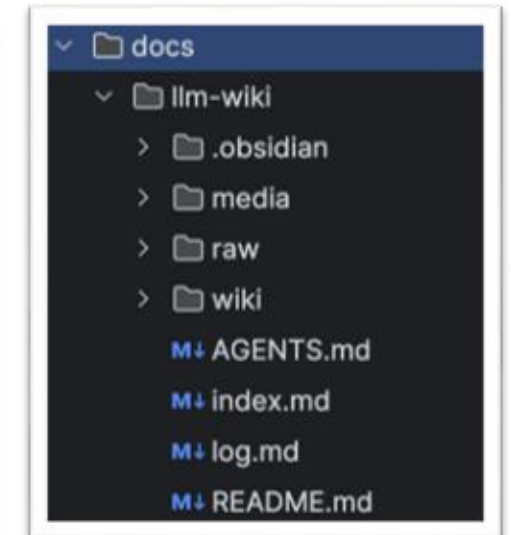
→ Created entity relationship page and linked domain model

[2026-07-15] update | database model

→ Added financial data and benchmarking concepts

[2026-07-15] docs | wiki guide

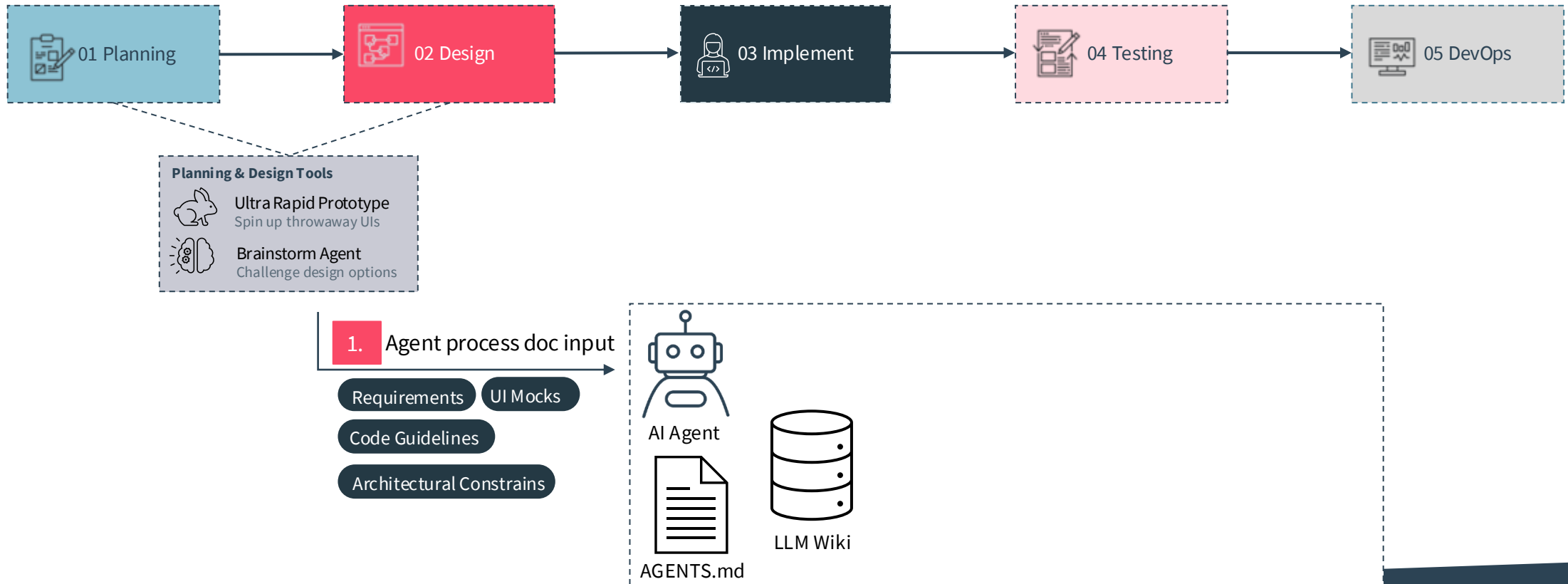
→ Added README.md



LLM WIKI

Initial Load

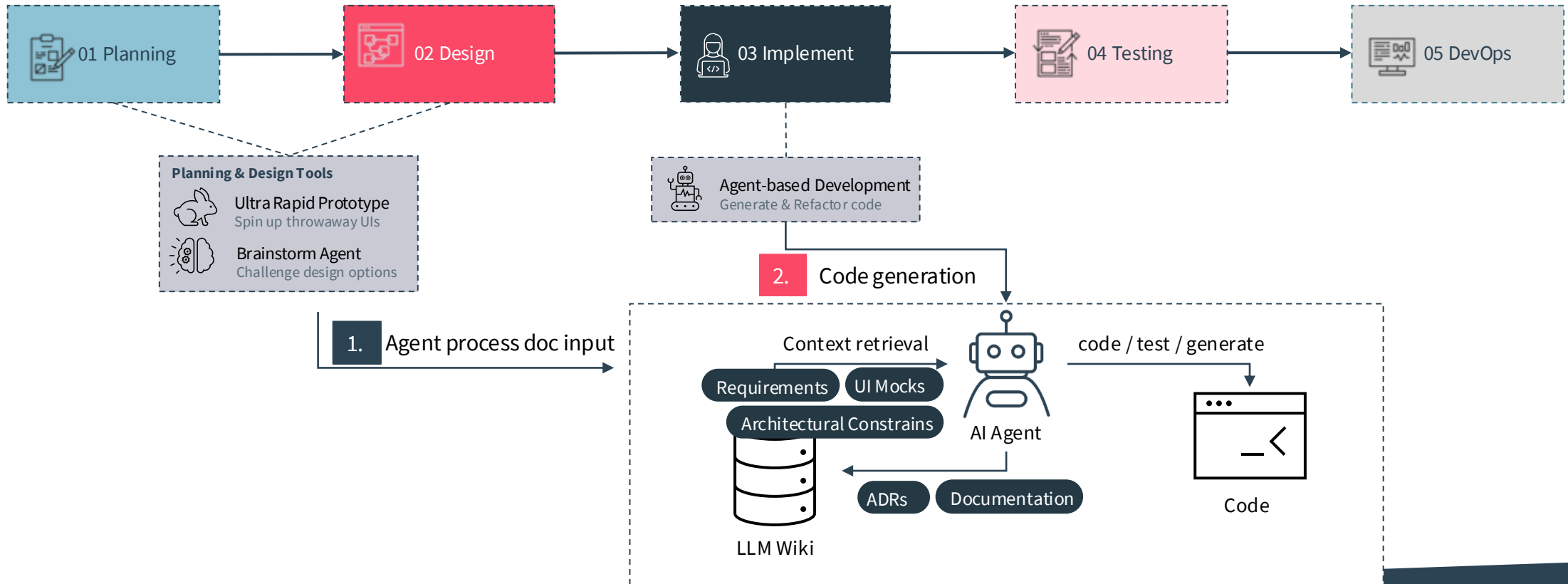
SOFTWARE DEVELOPMENT LIFE CYCLE



LLM WIKI

Code Generation

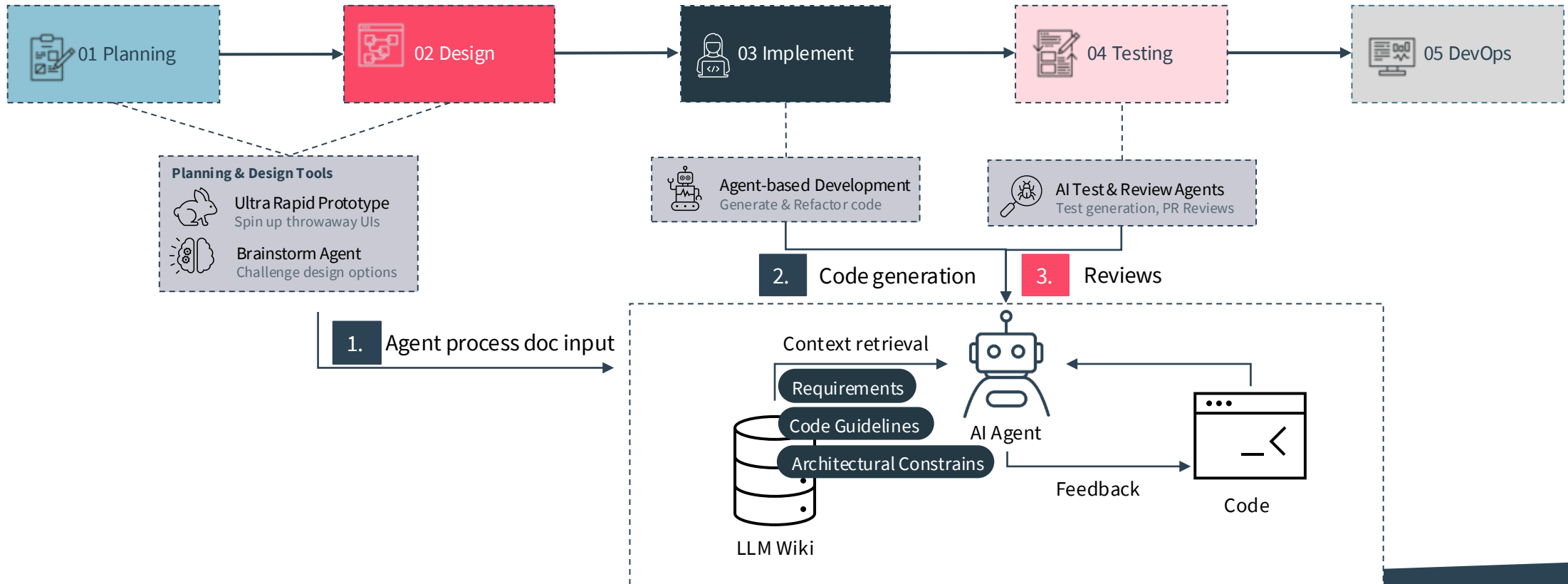
SOFTWARE DEVELOPMENT LIFE CYCLE



LLM WIKI

Reviews

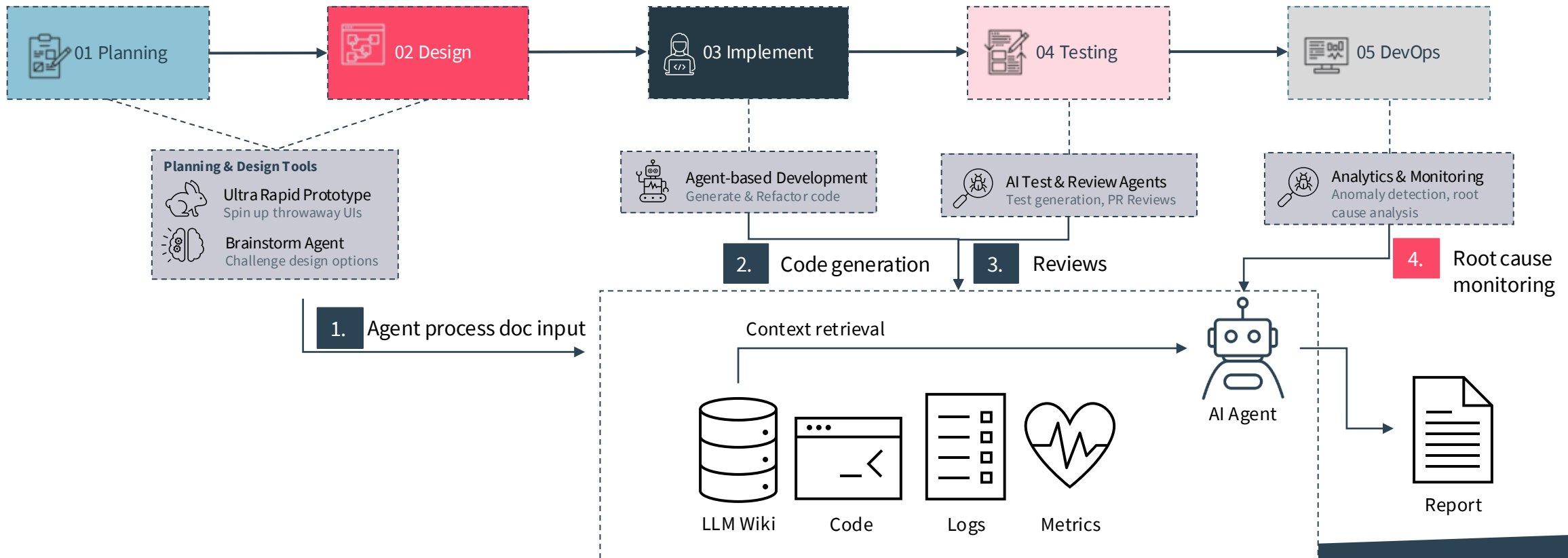
SOFTWARE DEVELOPMENT LIFE CYCLE



LLM WIKI

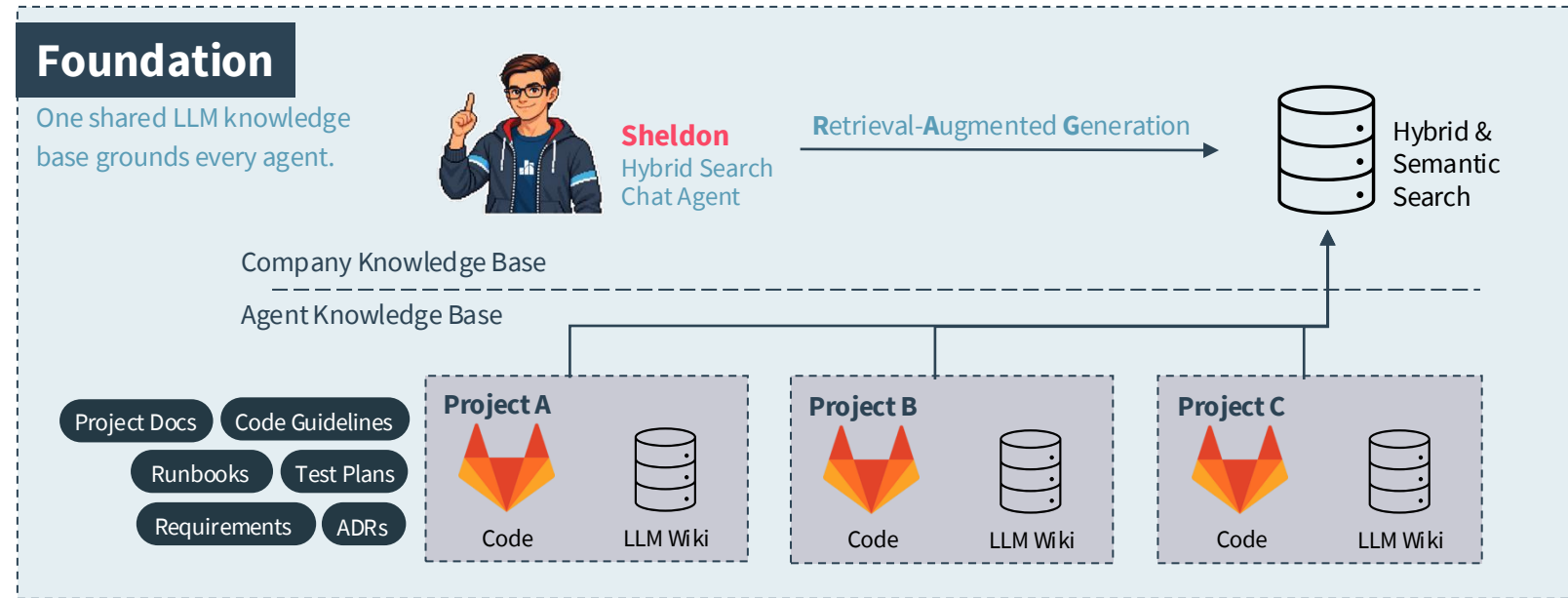
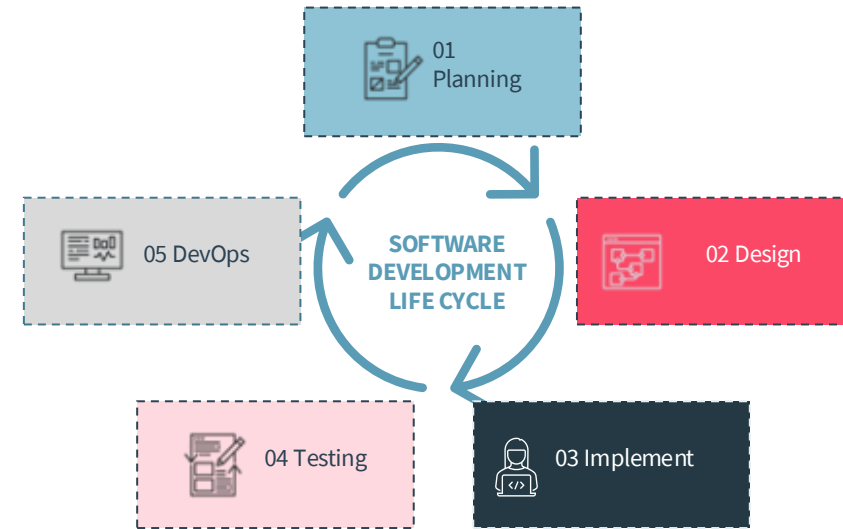
Advanced Tasks

SOFTWARE DEVELOPMENT LIFE CYCLE



Knowledge Aggregation

Store Knowledge accessible for Agents



Sheldon

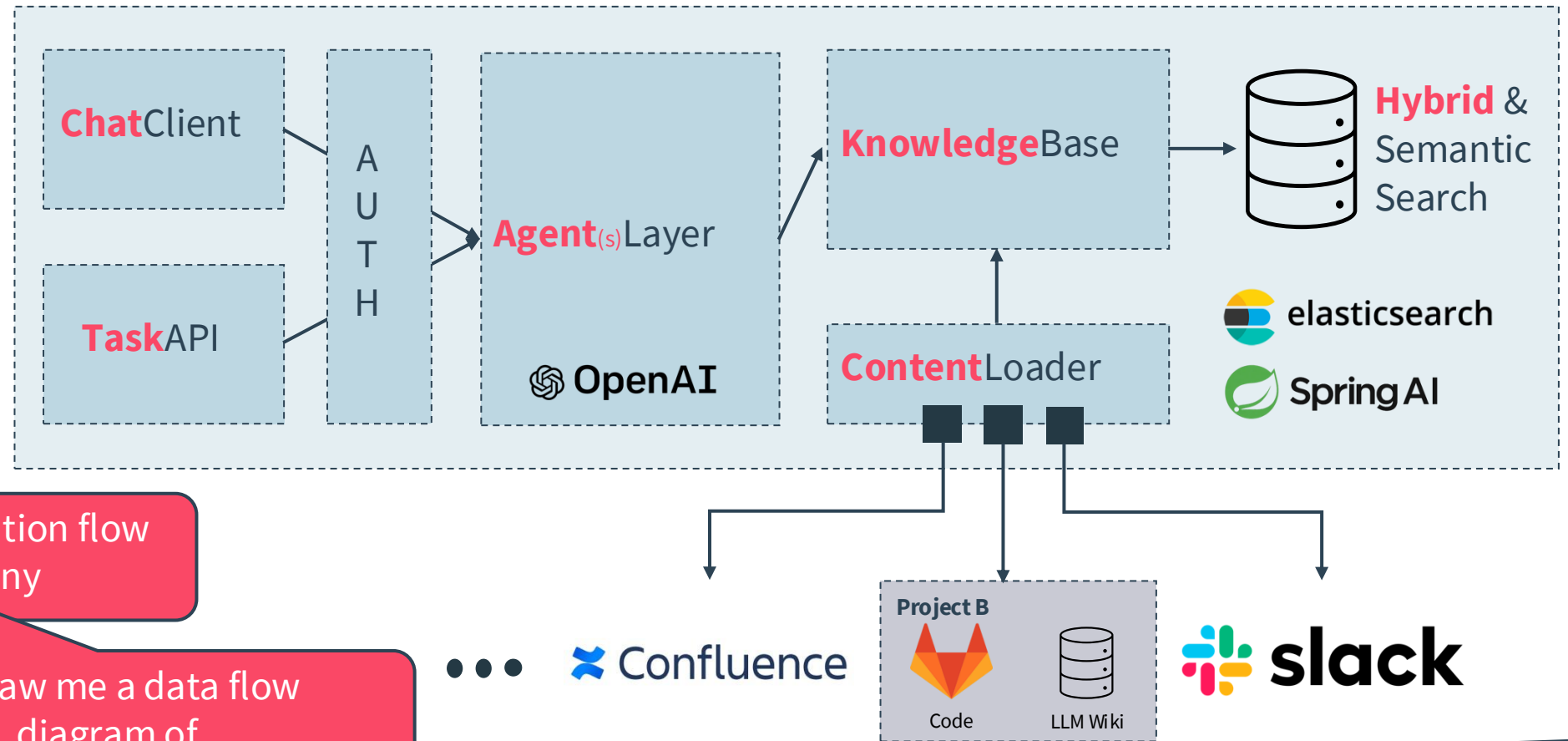
Company Knowledge Base

Why and when have we introduced ... in Project B



Sheldon

Hybrid Search
Chat Agent



Explain the information flow
in my company

Draw me a data flow
diagram of ...



Knowledge Aggregation

Store Knowledge accessible for Agents

Lessons Learned:

Use caching

Don't economise content

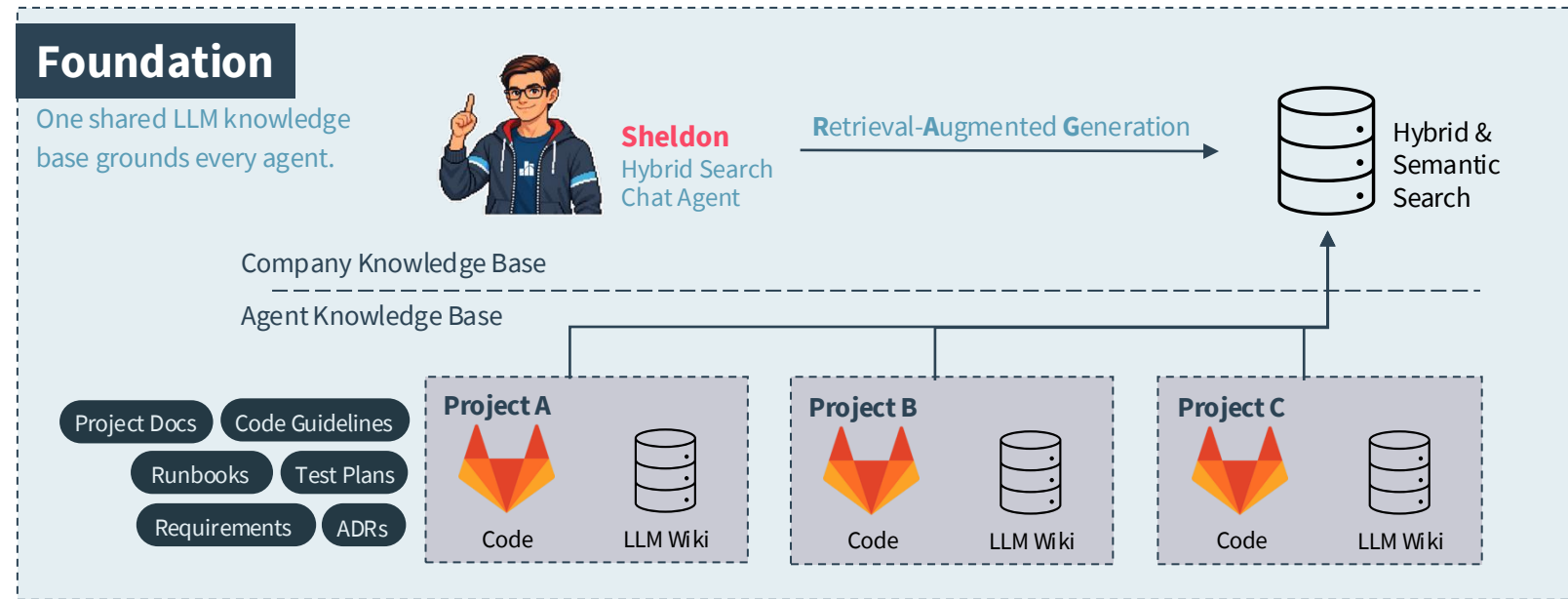
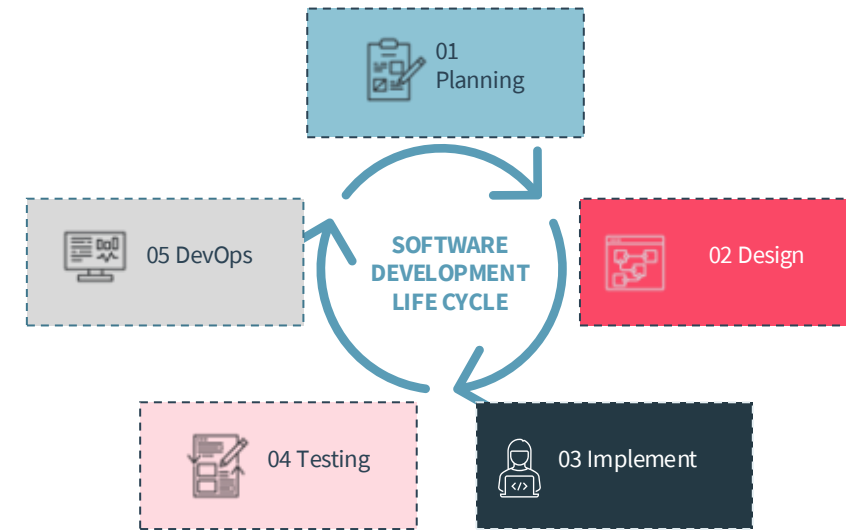
<300 pages per Wiki

LLM Wiki content management

Docu as part of review

Use hybrid search

RAG as tool



Knowledge Aggregation

Store Knowledge accessible for Agents

Lessons Learned:

Use caching

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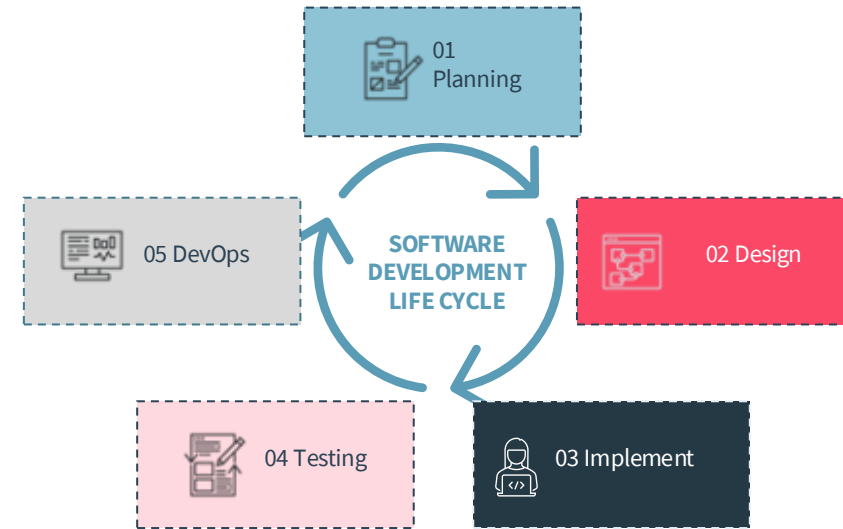
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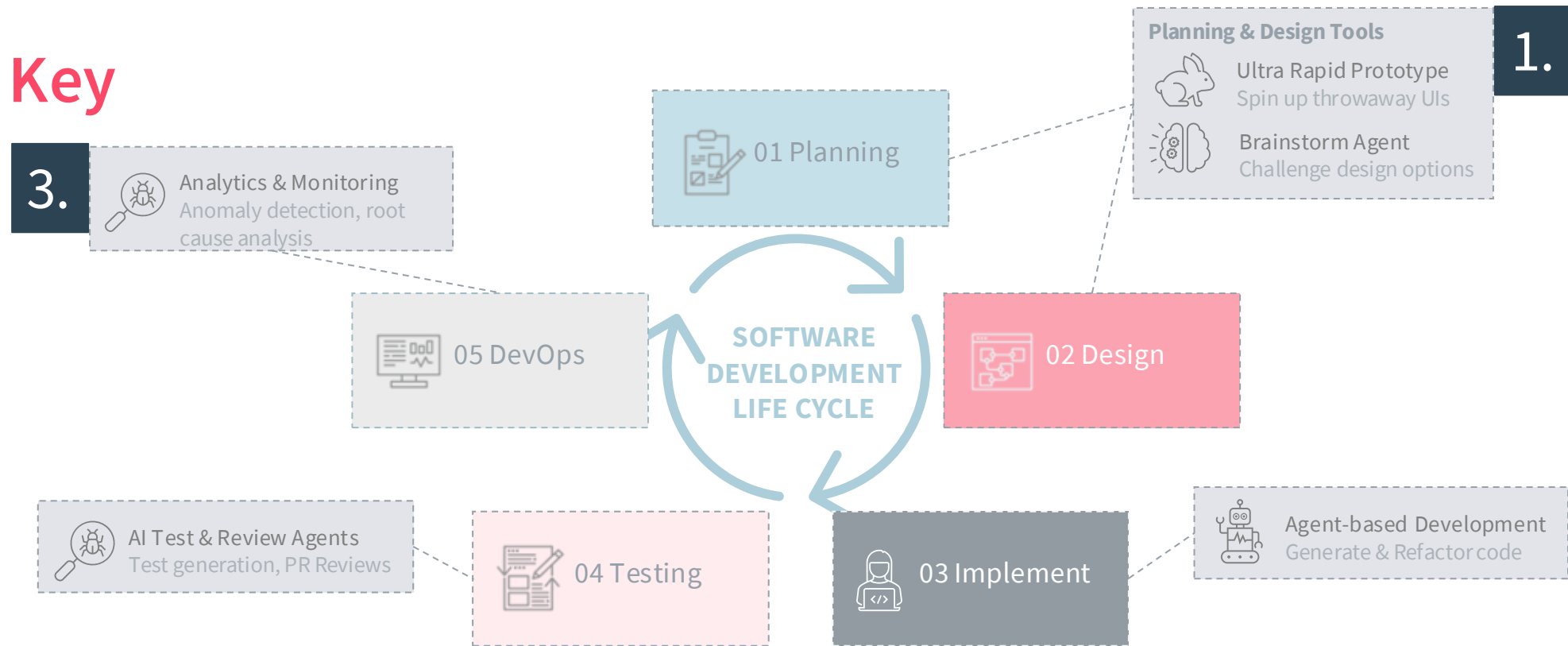
RAG as tool



Context as Foundation



Context is **Key**

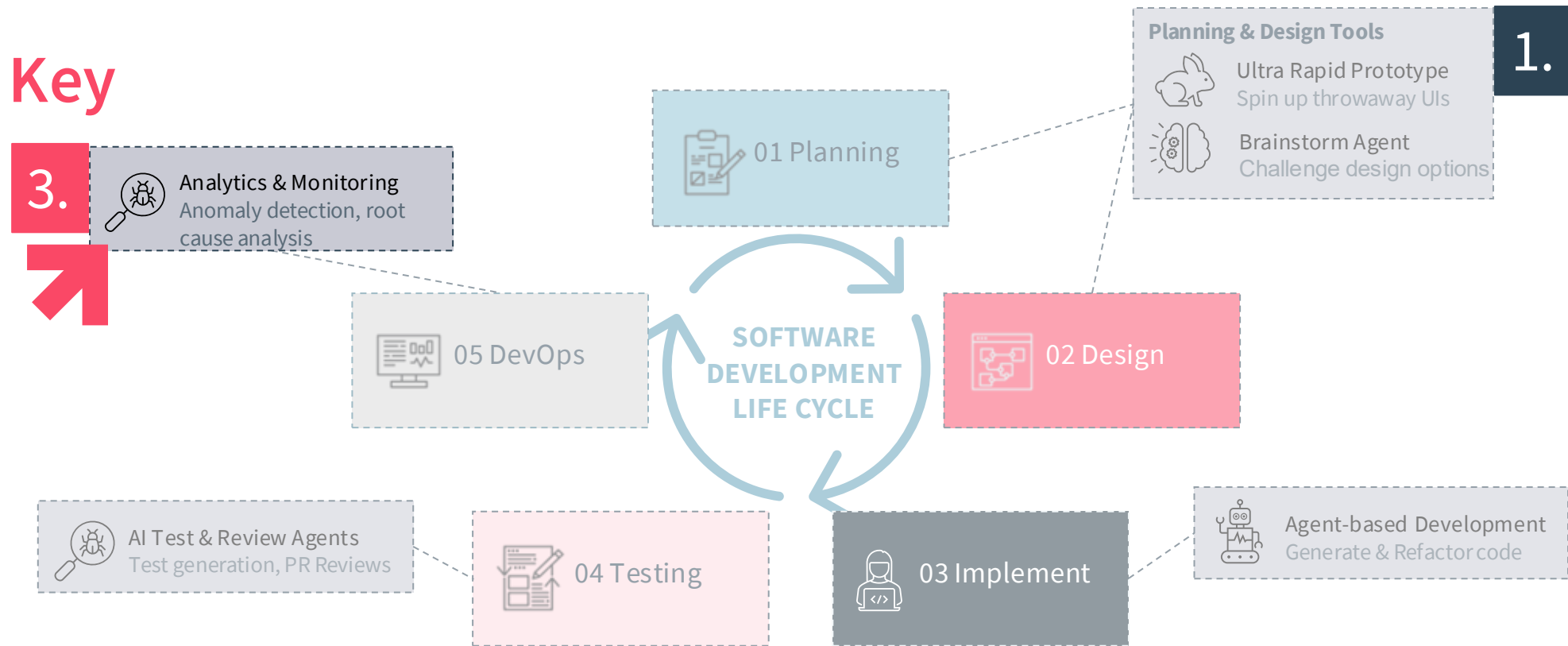


2.

Context as Foundation



Context is Key



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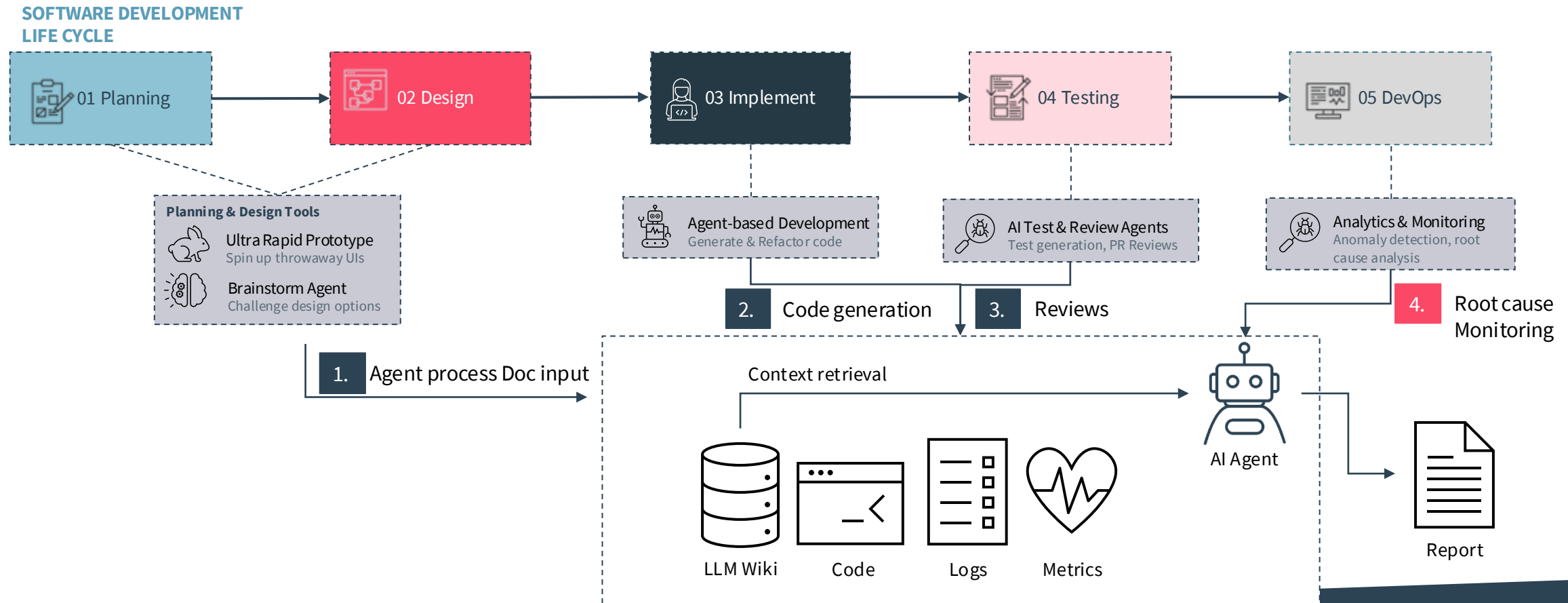
AI-SUPPORTED MONITORING

Detect anomalies **early**
Resolve incidents **faster**



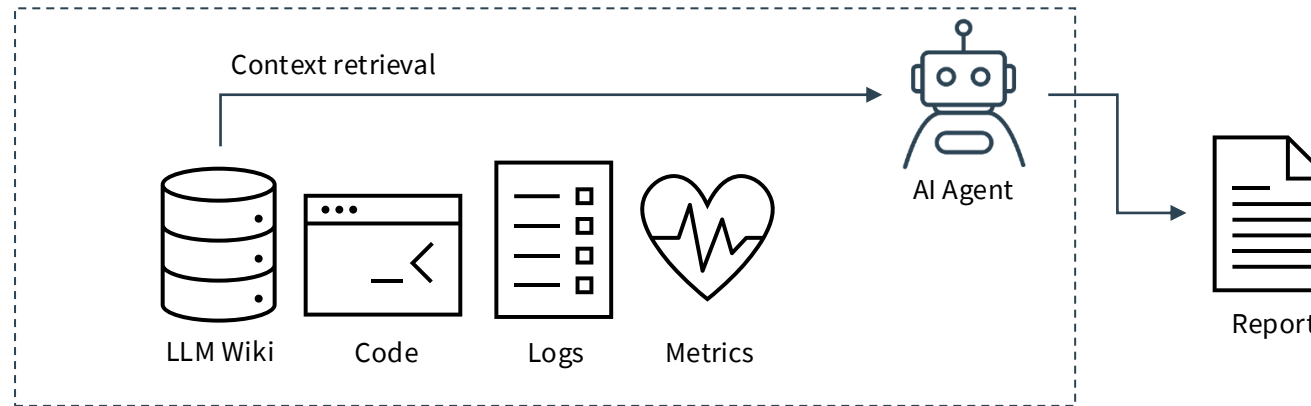
AI Supported Monitoring

Advanced Tasks



Potential Applications

Supporting humans during OPs



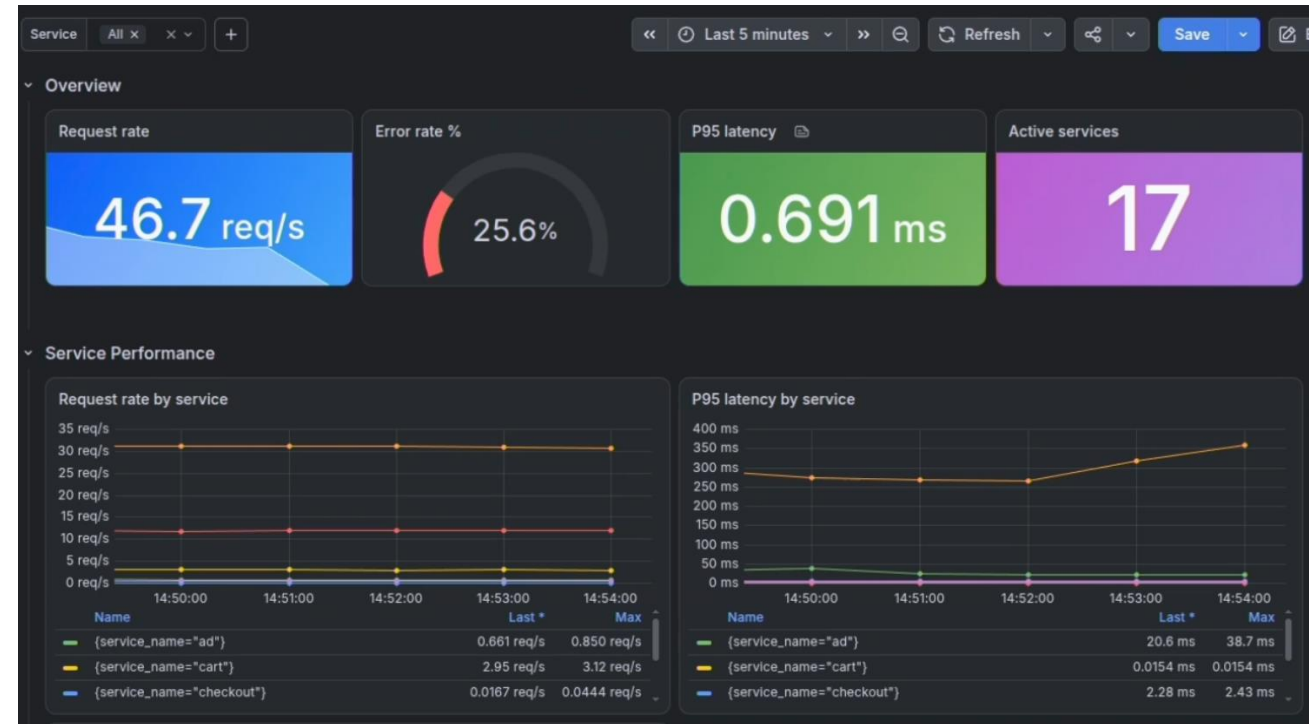
Incident Management

Chat to monitoring

- Natural language to define queries and dashboards



Create a dashboard for application xyz showing metrics, logs traces.

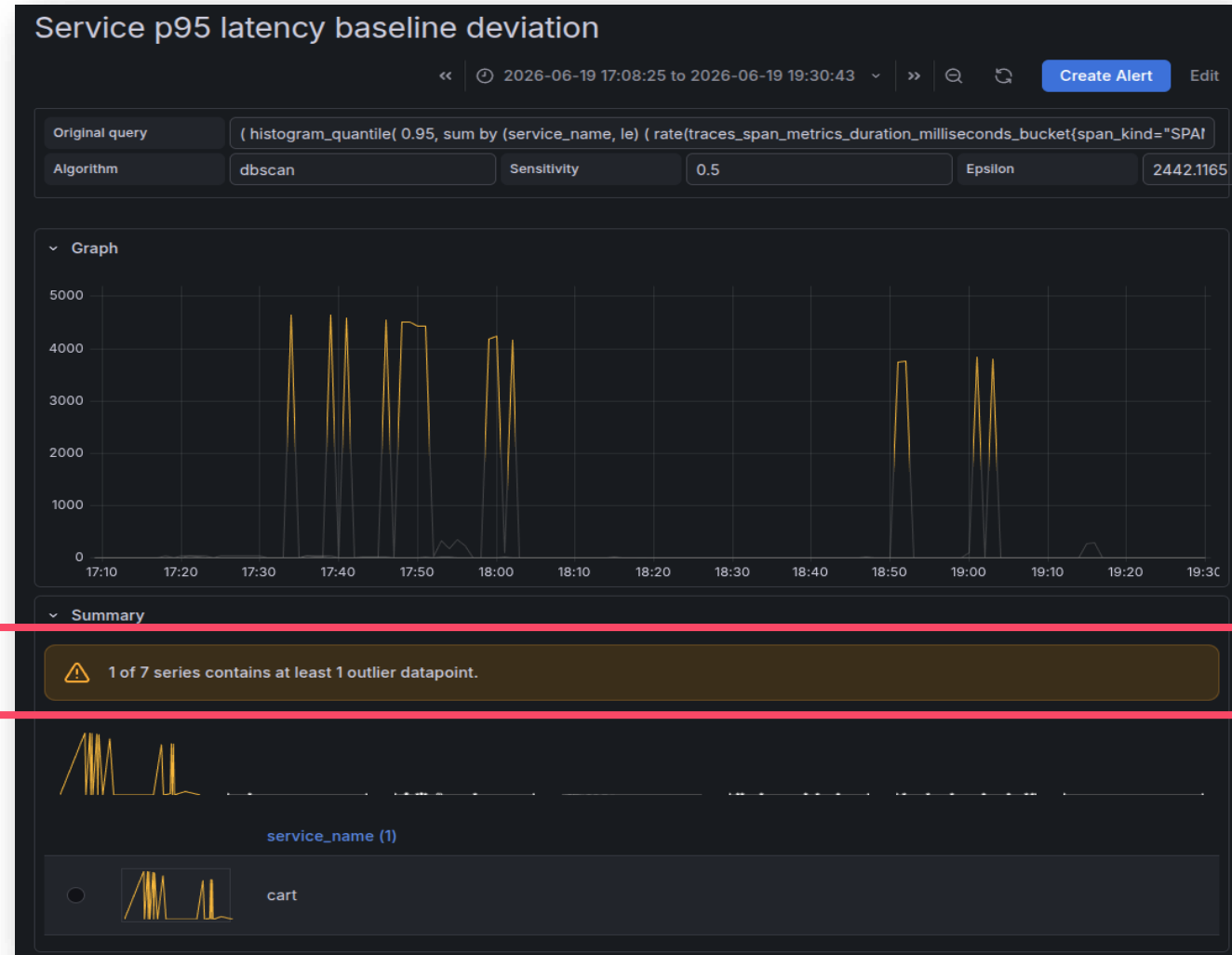


Incident Management

Intelligent Alerting



- Patterns and anomalies can be detected, before users notice disruption
- Alert noise is aggregated and prioritized based on relevance



Incident Management

Root Cause Analysis



We see high CPU load what might be the root cause?

- Formulation of various hypotheses
- Verification using metrics, logs, and traces
- Determined root cause in **~2.5 min**
- Documentation for Post-Mortems

Investigated ▾

Hypothesis updates 3d ago · 3 changed

H1	cart service p99 latency 10s on EmptyCart route since 15:15Z —...	Open	→	Symptom
H2	cartFailure feature flag enabled, causing EmptyCart's ValkeyC...	Open	→	Root Cause
H3	cart resource exhaustion not the cause	Blocked	→	Disproven

The `cartFailure` feature flag was enabled and became the sole evaluating variant by ~15:18Z, triggering a broken code path in `ValkeyCartStore.EnsureRedisConnected()` that causes every `EmptyCart` call to hang indefinitely with no timeout — producing p99 latency of 10 seconds (capped at histogram max) on the `/oteldemo.CartService/EmptyCart` route since 15:15Z. Redis itself is healthy (`GetCart` succeeds in 0.4ms on the same connection in affected traces), confirming the failure is entirely code-path-driven by the flag. All other services and cart operations (`GetCart`,

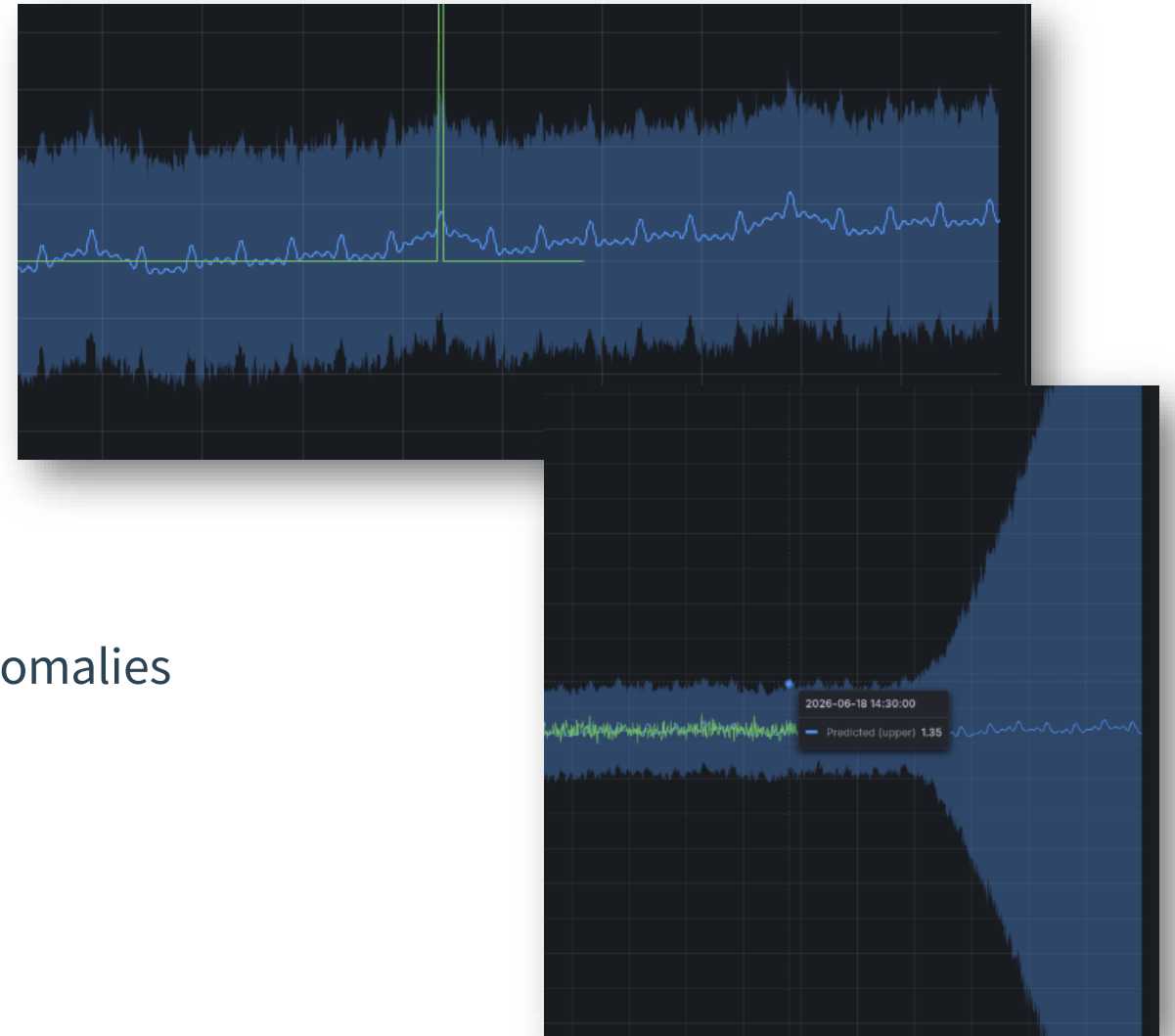


Predictive Insights

See where signals are heading



- Use of machine learning to anticipate future demands and trends
- Planning of resources at an early stage, preventing bottlenecks
- Analyze seasonal trends and detect potential anomalies



RECAP

Without a shared **context**, every **AI tool** remains an isolated **experiment**.



Recap



...but nothing shipped.

- ✗ Prototypes stayed prototypes
- ✗ Nobody understood the code
- ✗ Twelve tools, zero glue
- ✗ Benefit still unproven

Without a shared **context**, every **AI tool** remains an isolated **experiment**.

NOW

Method beats tooling.

- █ The whole life cycle
- █ Approaches, not tools
- █ Human in the loop

1.

From Data to Knowledge

Each step adds structure and context to the raw project material



2.

Foundation

One shared LLM knowledge base grounds every agent.



3.

Potential Applications

Supporting humans during OPs



Recap



... improved quality and time to prod.

- ✓ Prototypes are part of SDLC
- ✓ Content grounds all tools
- ✓ Docu for AI and Devs
- ✓ Speed and quality improvement

One shared **context** grounds all **AI tool**
in the **Software Development Life Cycle**

NOW

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KONTAKT

Sprechen wir über AI-Natives Software Engineering –
wir freuen uns auf den Austausch.



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<https://avantgarde-labs.com>

