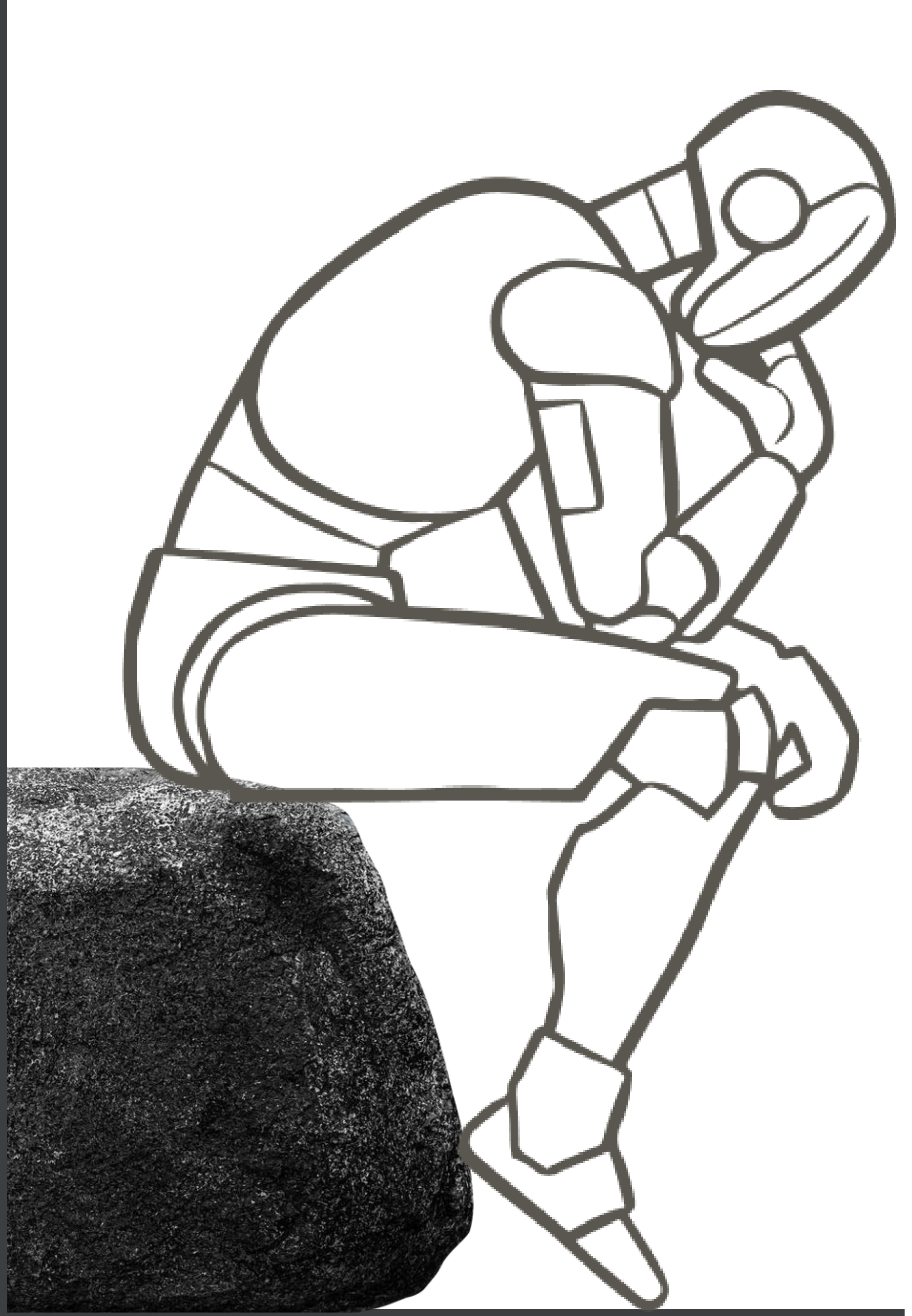


Speaking the Same Language

How Components Let AI (Finally) Understand you

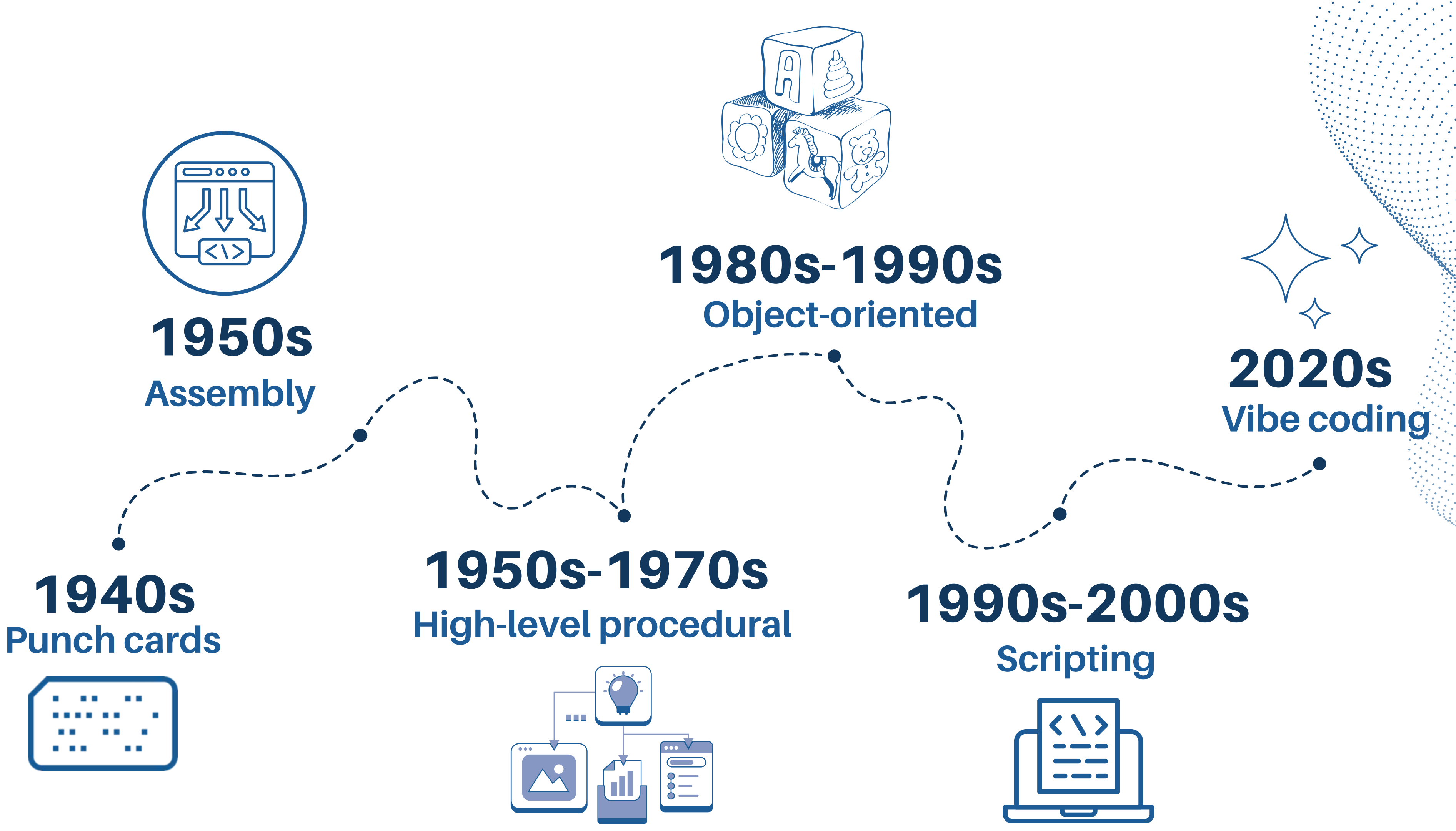
Laly Bar-Ilan

Chief Scientist at Bit
https://bit.cloud

From Punch Cards to Vibe Coding

How we moved away from the hardware

The history of programming is the history of making machines fluent in human language.



1940s
Punch cards

1950s
Assembly

1950s-1970s
High-level procedural

1980s-1990s
Object-oriented

1990s-2000s
Scripting

2020s
Vibe coding

We no longer move single bytes, we move products and features.

The Building Blocks of Software

Using bigger and more complex building blocks

Single-bit operations

Assembly instructions

Higher-level procedures

Objects and methods

Components

What Are Components?

Components are independent software entities that are designed to be reused and shared across projects.

Button

Header

Shopping-cart

Webpage

Mongo-handler

Item

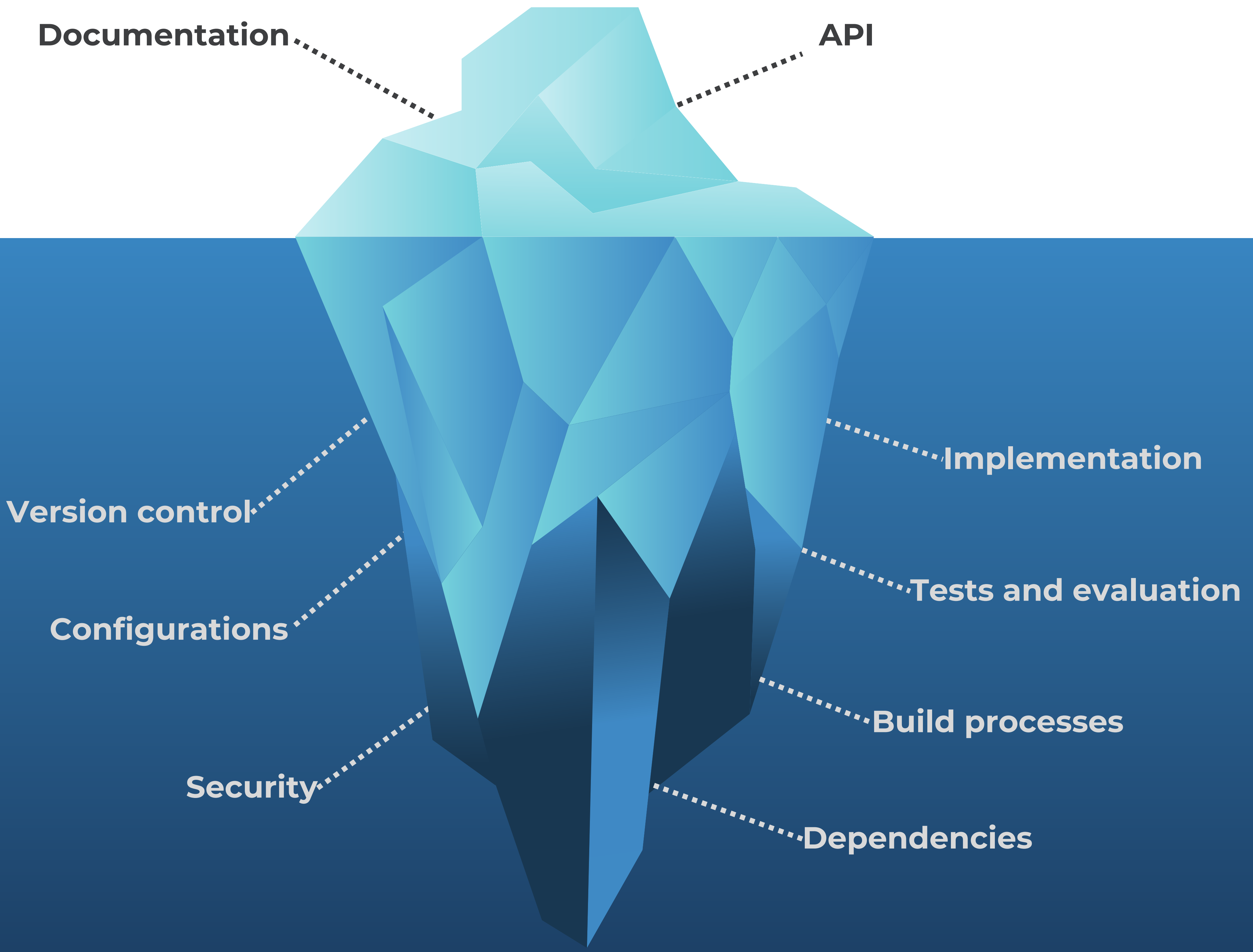
User

Search-service

Authentication-service

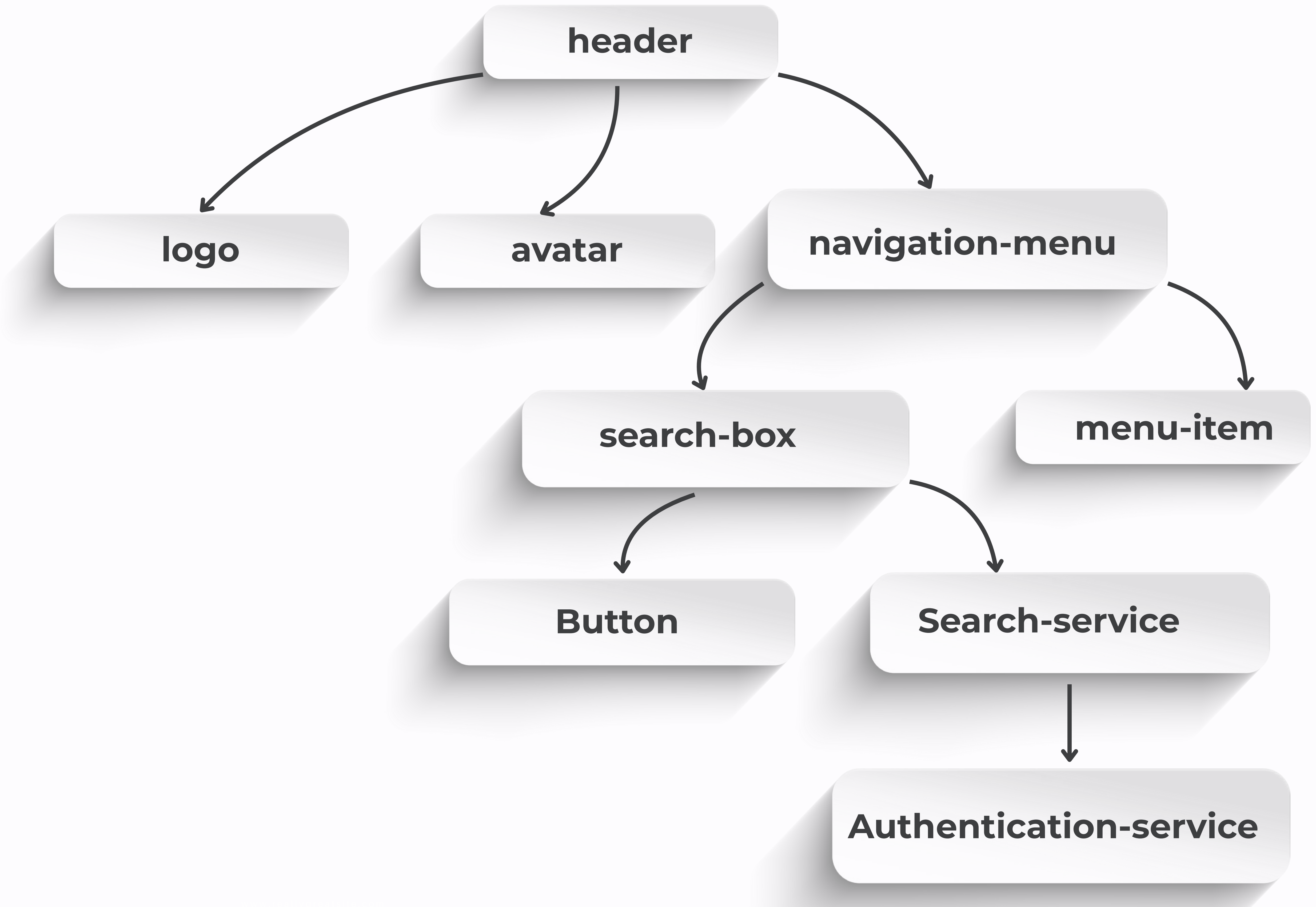
What Are Components?

In order to build with components, you don't need to see the implementation, only the surface.



The Component Graph

The Graph represents the syntax of the component language, stating the dependency relations between components.



A Map of Functionality

The Graph is a live map of the entire business and product functionality in the organization.

- Visible to all
- Promotes reuse
- Prevents inflation
- Teachable to AI

button
price
menu
loader
header
carousel
billing-service
auth-service
avatar
search-box
logo
footer
User

The Difference Between AI and Human Developers

We see the functional boundaries between products and features, and this is what we want to teach AI to do.

Seeing the terrain

Seeing the functional boundaries

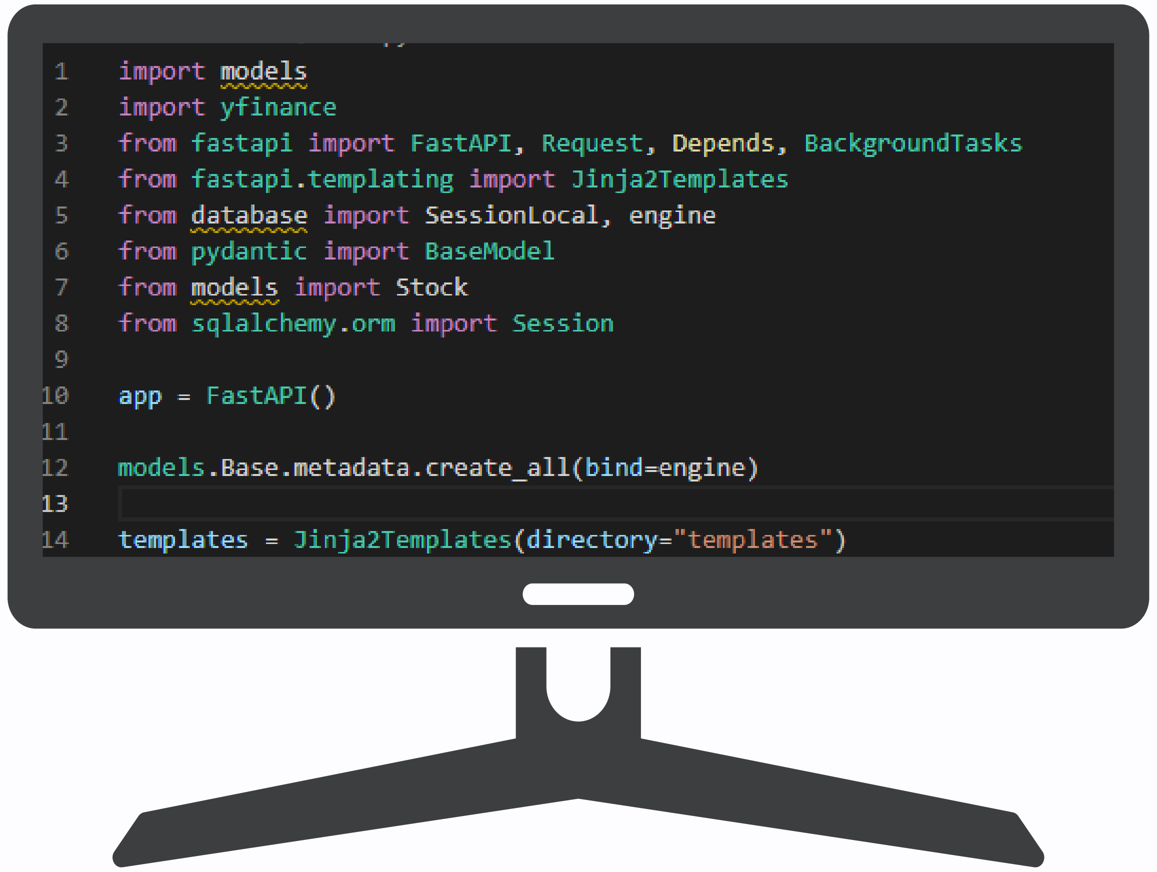
We want to teach AI to work with components because they have clear business or product meaning, and encapsulate their implementation.

Less Tokens, More Components

Tokens	Components
Syntax-level meaning	System-level meaning
Harder task: generation	Easier task: composition
Irrelevant context	Accurate context

Less Inference, More Composition

Instead of inferring the product functionality and dependency relations, the model gets them explicitly.

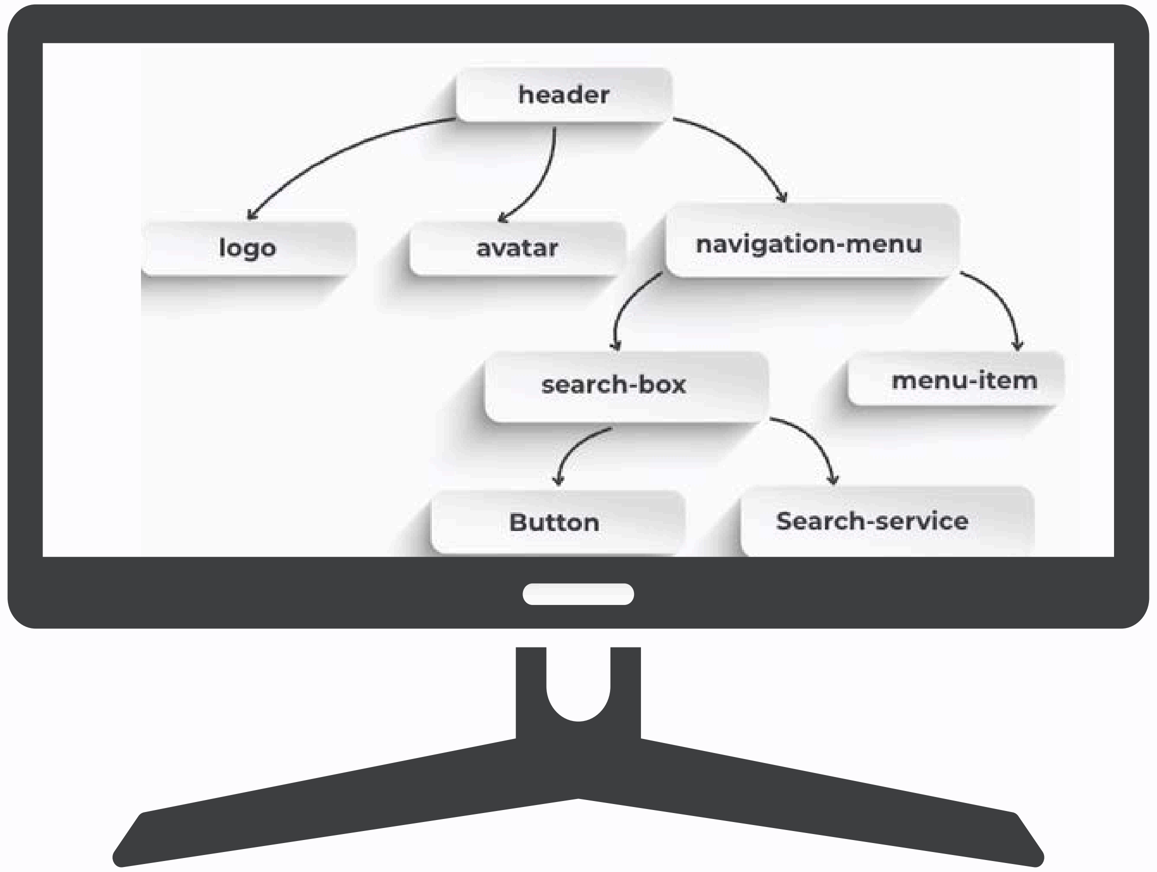


```python
import models
import yfinance
from fastapi import FastAPI, Request, Depends, BackgroundTasks
from fastapi.templating import Jinja2Templates
from database import SessionLocal, engine
from pydantic import BaseModel
from models import Stock
from sqlalchemy.orm import Session

app = FastAPI()

models.Base.metadata.create_all(bind=engine)

templates = Jinja2Templates(directory="templates")
```



header

logo

avatar

navigation-menu

search-box

menu-item

Button

Search-service

Top-down architecture: defining which components to use, and composing existing ones.

Bottom up generation: generating glue code and new components

A Hybrid Approach

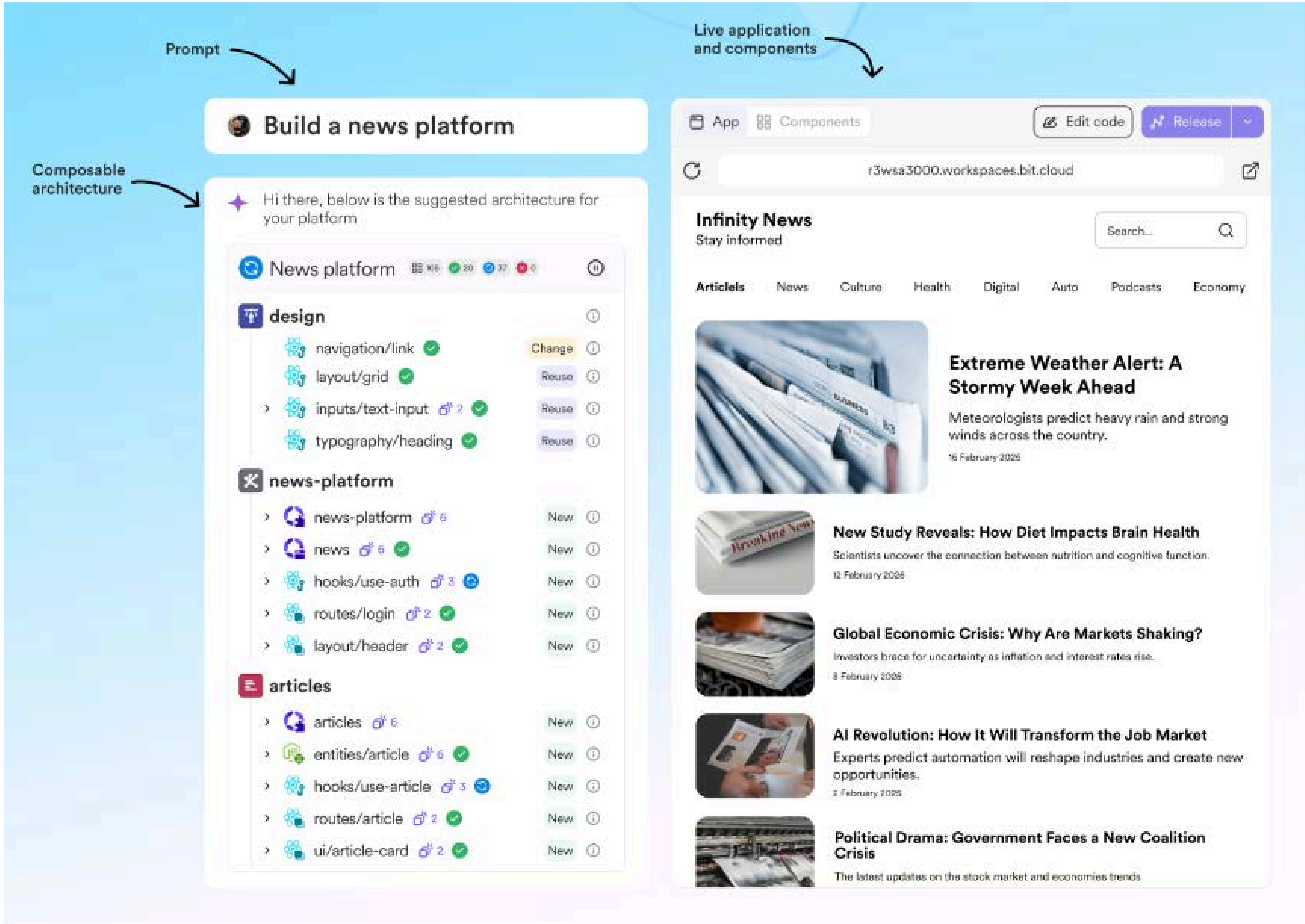
Architecture

EXISTING
COMPONENTS
NEW
COMPONENTS

Token generation

What It Actually Looks Like

1. **Prompt**
2. **Architect**
3. **Reuse**
4. **Generate**
5. **Deploy**



Prompt

Composable architecture

Live application and components

Build a news platform

Hi there, below is the suggested architecture for your platform

News platform 105 20 37 6

design
- navigation/link — Change
- layout/grid — Reuse
- inputs/text-input 2 — Reuse
- typography/heading — Reuse

news-platform
- news-platform 6 — New
- news 6 — New
- hooks/use-auth 3 — New
- routes/login 2 — New
- layout/header 2 — New

articles
- articles 6 — New
- entities/article 6 — New
- hooks/use-article 3 — New
- routes/article 2 — New
- ui/article-card 2 — New

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How This New Approach Helps Developers

SPEED

- Less implementation, more architecture
- Ship faster with code reuse
- Compounding effect over time
- Validate components before deployment

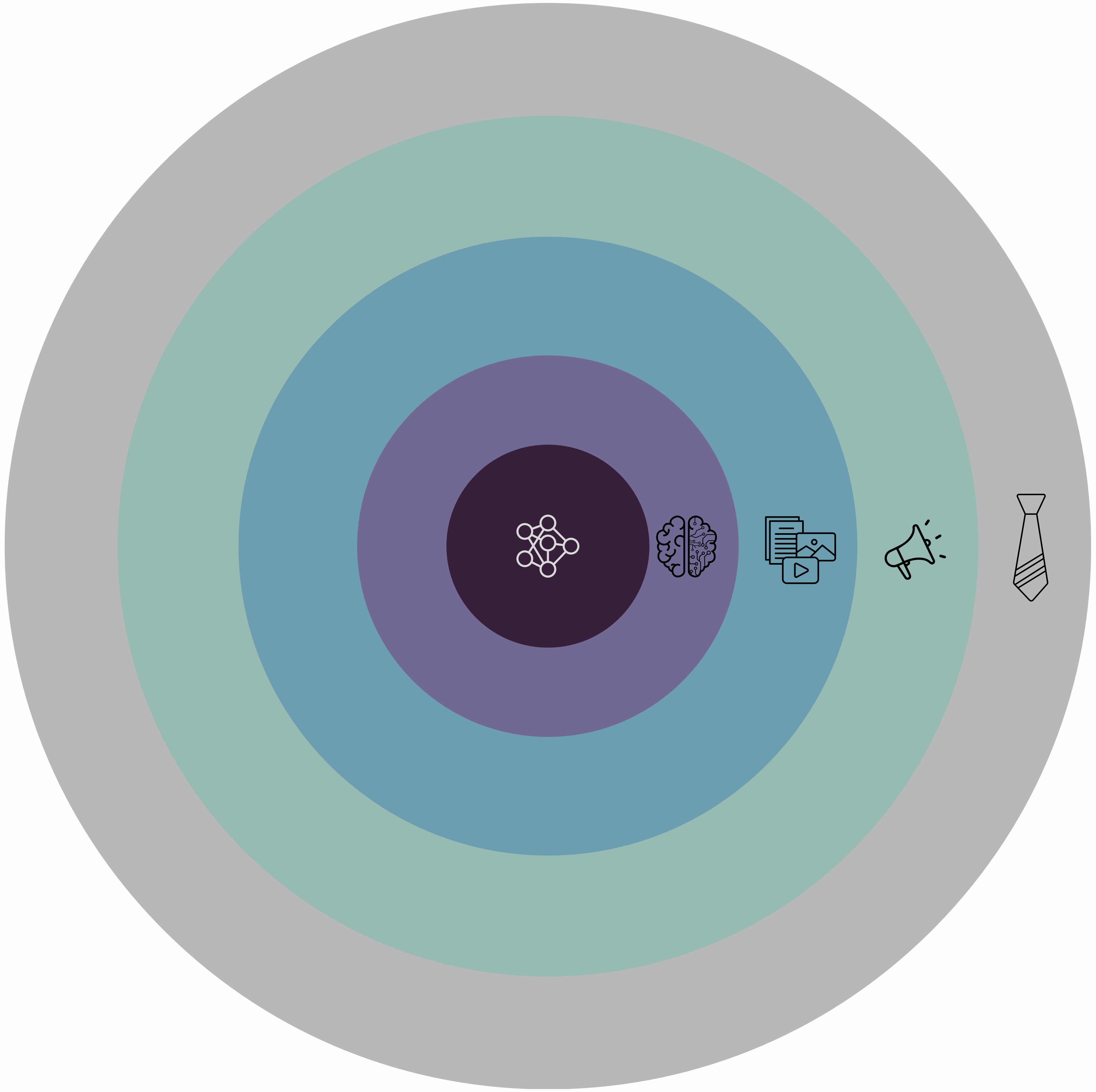
How This New Approach Helps Developers

Maintainable Codebase

- The Component graph makes the entire codebase visible and therefore reusable
- Changes are not scattered across repos
- Reuse stops codebase from inflating uncontrollably

Collaboration

How This New Approach Helps Developers



Component graph
The basis for collaboration

Developers and AI
features, architecture, review

PMs and designers
Iterate, review, approve

Business teams
Visibility of product progress

Leadership teams
Higher-level visibility

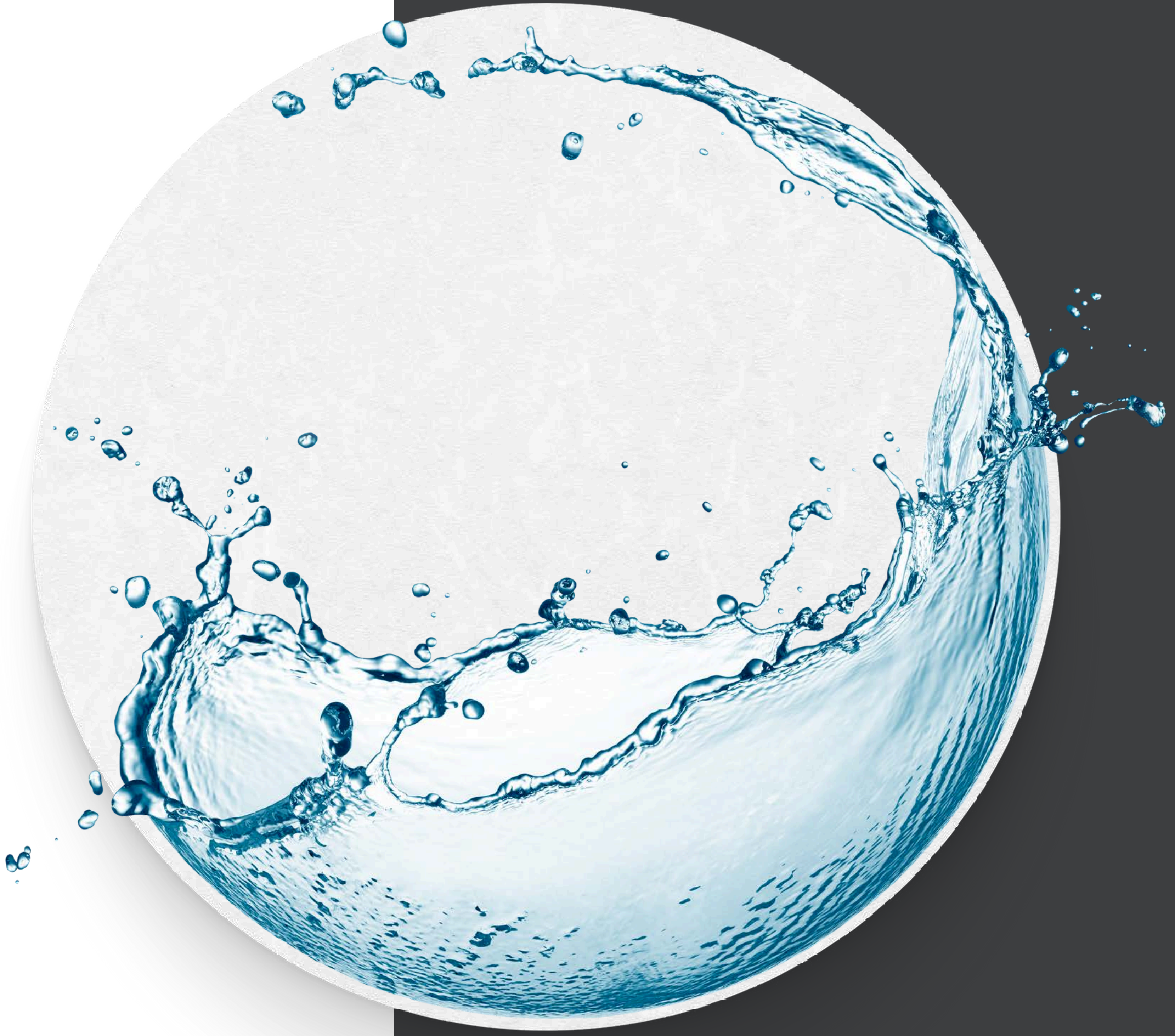
Humans in the Loop

How This New Approach Helps Developers

- Components are a shared entity to collaborate on and improve over time
- Codebases lean and understandable to humans in the long run
- A modular component-based approach ensures granular permissions

How This New Approach Helps Developers

Now humans and AI speak the same language: the language of product functionality, architecture and intent.



Thank You!

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