



# AI-Powered Hardware Ideation and Simulation Assistant

A RAG-Based Prototyping Copilot

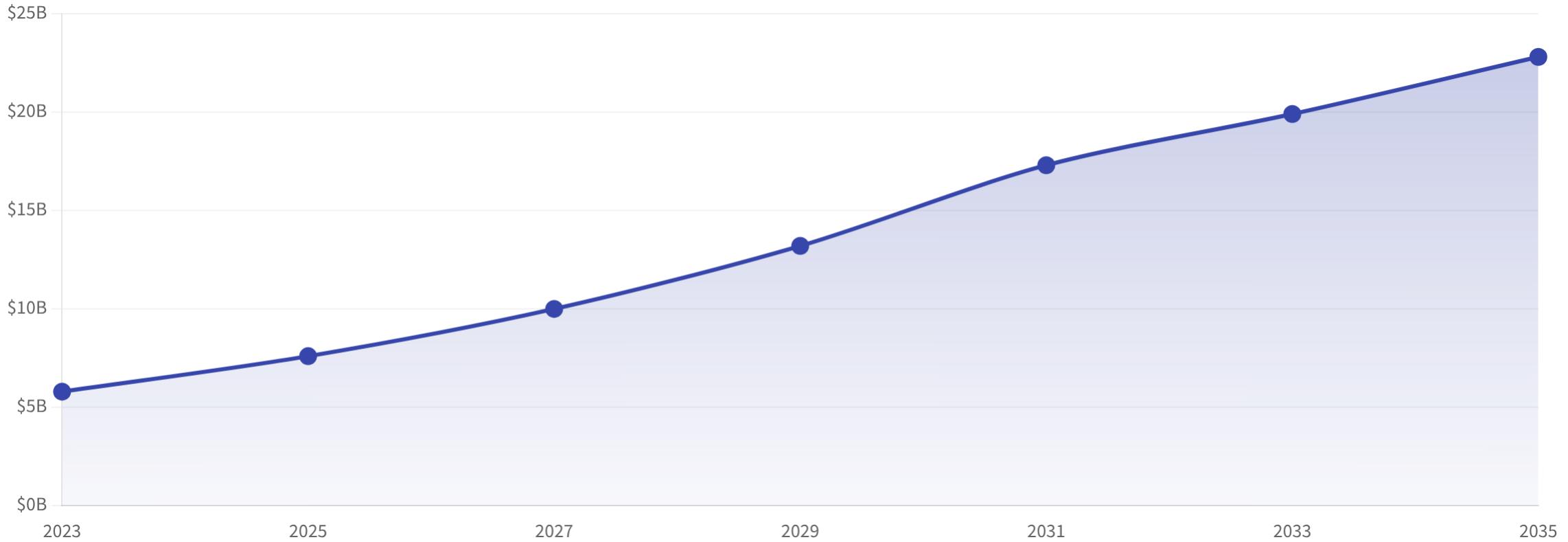
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EMC Testing

# Problem Statement

-  Hardware prototyping requires **specialized knowledge** and **multiple disconnected tools**
-  Iteration cycles are **slow** and **error-prone**, limiting innovation
-  No integrated solution exists that combines **ideation**, **design**, and **simulation** in one platform

# Electronic Prototyping Market Growth



**\$5.8B**

2023 Market Size

**14.6%**

CAGR (2025-2035)

**\$22.8B**

2035 Projected Size

The electronic prototyping market is experiencing **rapid growth**, creating significant opportunities for AI-powered solutions

# Solution Vision



**AI-powered copilot that transforms hardware ideas into functional prototypes**



**From component selection to working simulation in minutes, not weeks**

# Before AI vs With AI

## Before AI



**Manual circuit design** with multiple disconnected tools



**Long iteration cycles** (days to weeks)



**Frequent errors** requiring manual debugging



**Manual code writing** for each component

VS



**AI-assisted design** with intelligent suggestions



**Instant iteration** (minutes)



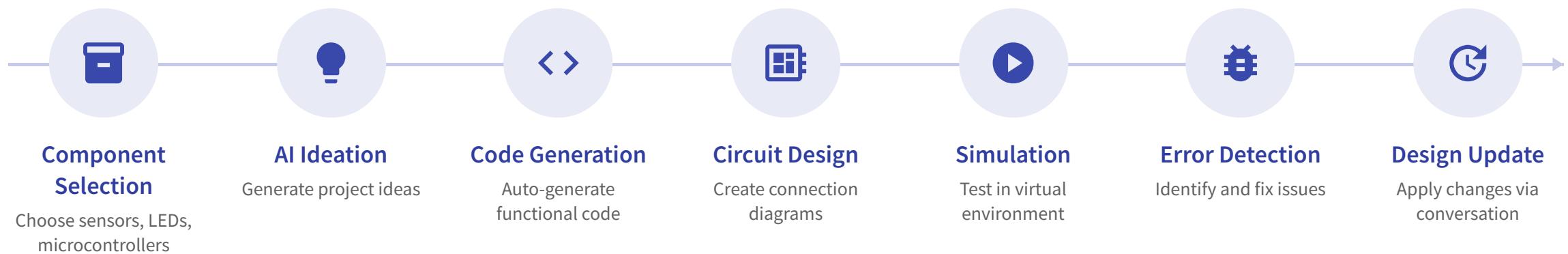
**Automatic error detection** and fixes



**Automatic code generation** for all components

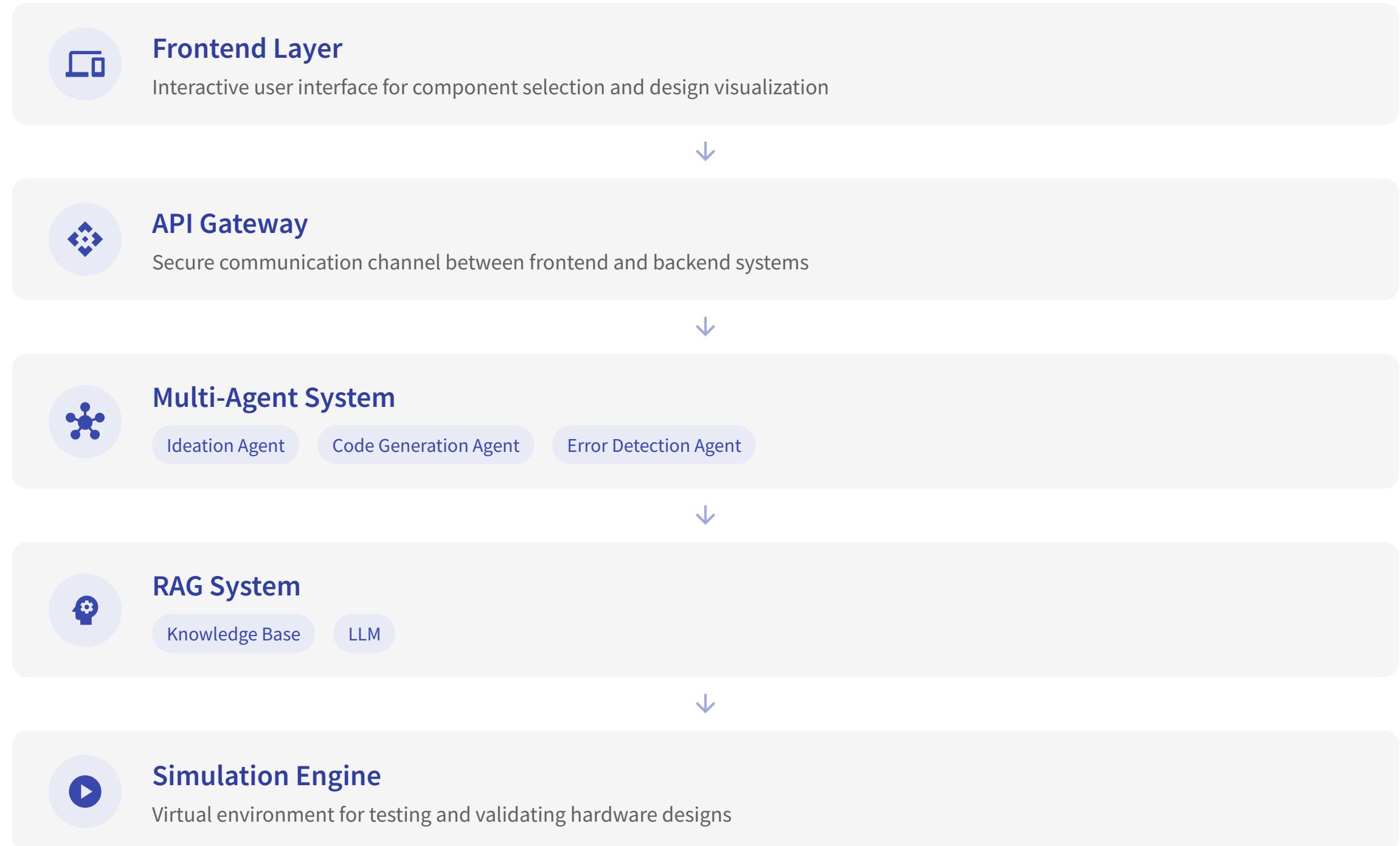
## With AI

# System Workflow



Streamlined workflow powered by **RAG + multi-agent AI** architecture

# Architecture Overview



**RAG + multi-agent** architecture enables seamless integration of ideation, design, and simulation

# Comparison Table

Solution	AI Ideation	Auto Code Gen	Error Detection	Simulation	Educational Focus
 Traditional Tools	✗	✗	✗	✗	✗
 Existing Simulators	✗	✗	✗	✓	✗
 Our Solution	✓	✓	✓	✓	✓

Only solution combining **AI ideation + multi-agent workflow + educational focus**

# Roadmap Extensions

2025

Q1 2025



## Core RAG System

Knowledge base integration with LLM

Q2 2025



## Multi-Agent Framework

Specialized agents for ideation, code, and error detection

Q3 2025



## Advanced Simulation

Real-time circuit behavior visualization

Q1 2026



## Hardware Integration

Direct connection to physical components

Q2 2026



## Community Marketplace

Share and discover project templates

2026

Strategic development focused on **user experience** and **scalability**

# **Only solution combining AI ideation + multi-agent workflow + educational focus**



AI Ideation



Multi-Agent Workflow



Educational Focus