



OFFICE COURSE

Generative UI

Presented by

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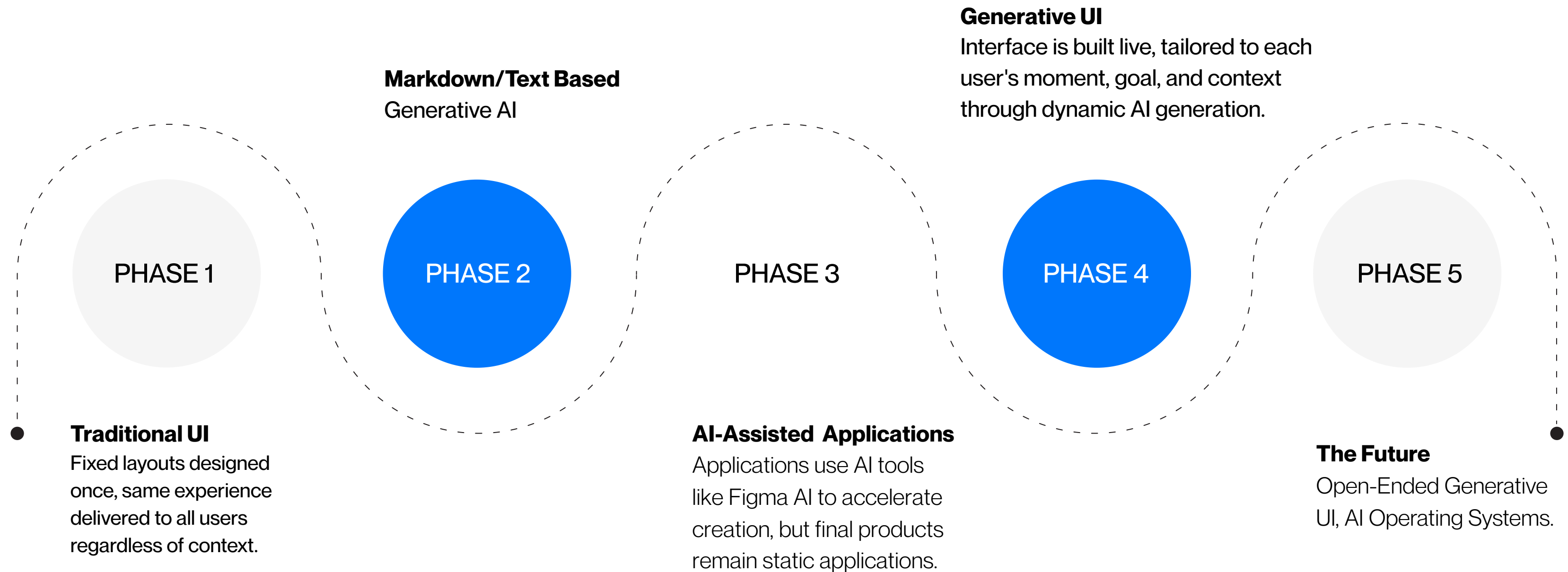
What is Generative UI?



Interfaces that are dynamically created or adapted in real-time by AI models, rather than relying solely on pre-coded screens designed in advance.



The Evolution





Soooo, What makes GenUI Great?

01.

Highly Personalized Experiences

Tailored to individual needs, preferences, and behavior patterns.

02.

Reduced Cognitive Load & Easier Learning Curve

GenUI only renders the Specific Tools needed for the current task.

03.

Rapid Iteration

Scale without exhaustive manual design cycles for each variation.

But...



Performance and Latency

Total generation Time can introduce significant latency compared to traditional, static UI rendering.



Hallucinations and Reliability

Large Language Models (LLMs) may attempt to pass incorrect props or invoke non-existent UI components.



User Experience (UX) Fragmentation

Constant UI mutation can confuse users who rely on muscle memory and consistent navigation patterns.



The GenUI Architecture

The transition from a natural language prompt to a functional UI component follows a structured, multi-step pipeline. This architecture ensures that the AI's "intent" is translated into type-safe, predictable frontend code.

1.

The Prompt

The user submits a natural language request, The system appends application state, system instructions to the prompt.

2.

Orchestration & Tool Calling

The model determines if it needs external data to fulfill the request. If data is required, the model triggers a Tool Call.

3.

Component Selection & Schema Matching

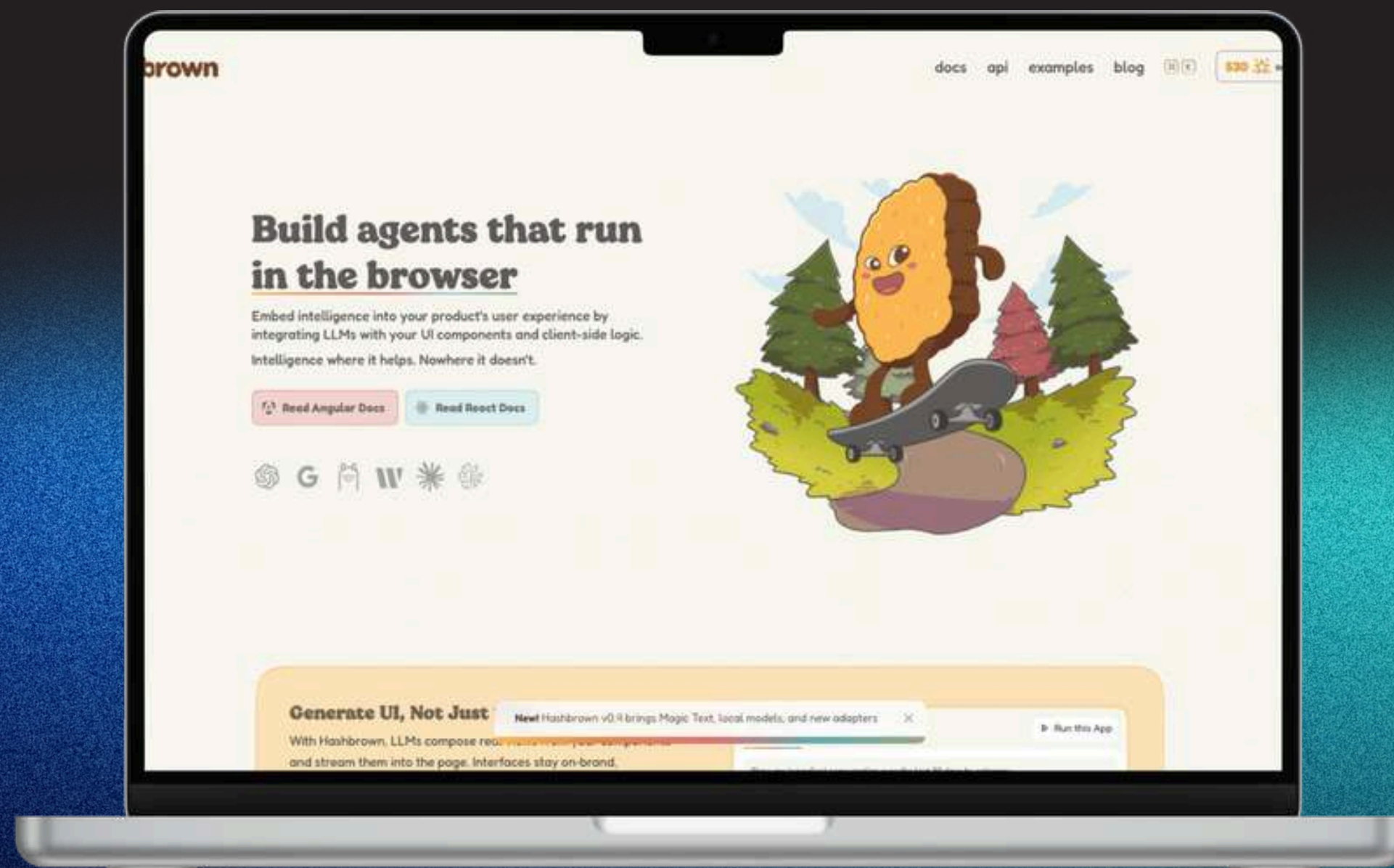
Based on the available "exposed" components, the LLM selects the most appropriate UI primitive

4.

Hydration & Rendering

The LLM-generated JSON is mapped to the React/Angular component's props.

Demo With Hashbrown AI SDK



Backend Setup

```
export const streamChat = async (req: Request, res: Response) => {
  const stream = HashbrownGoogle.stream.text({
    apiKey: env.GOOGLE_API_KEY,
    request: req.body,
  });

  res.header("Content-Type", "application/octet-stream");

  for await (const chunk of stream) {
    res.write(chunk);
  }

  res.end();
};
```



Frontend Setup

```
const { messages, sendMessage, isGenerating } = useUiChat({  
  model: "gemini-3-flash-preview",  
  debugName: "dashboard-ai-chat",  
  system: systemWithData,  
  components: exposedGenerativeUIComponents,  
});
```

Render the Components

```
if (message.role === "assistant" && "ui" in message) {
  const ui = message.ui;
  if (ui && Array.isArray(ui) && ui.length > 0) {
    return (
      <div
        key={idx}
        className="flex flex-col gap-3"
      >
        {ui.map((el, i) => (
          <React.Fragment key={i}>
            {el as React.ReactNode}
          </React.Fragment>
        ))}
      </div>
    );
  }
}
```



Thank you

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