HIREDNEXT: "Automated Intelligent Network for Interview Preparation"

A PROJECT REPORT
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DECLARATION

I hereby declare that the work presented in this report entitled "HIREDNEXT: Automated Intelligent Network for Interview Preparation" is my own original work carried out during April–May 2025 at the School of Computer Science Engineering and Technology, Bennett University. This work has not been submitted for any other degree or professional qualification.

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ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

AI – Artificial Intelligence

API – Application Programming Interface

DB – Database

UI – User Interface

SDK – Software Development Kit

Jupyter – Jupyter Notebook

ABSTRACT

HiredNext is an AI-driven interview preparation platform designed to simulate realistic, voice-based interview scenarios and deliver actionable feedback on both communication skills and content knowledge. Leveraging state-of-the-art natural language understanding and generative speech models, the system conducts two primary modes of assessment: (1) a general interview, in which candidates respond to a broad set of common behavioral and technical questions, and (2) a company-specific track, tailored to the question styles and topic areas favored by leading technology firms such as Google, Meta, and Microsoft. At the conclusion of each virtual interview session, HiredNext evaluates user performance across multiple dimensions—communication clarity, domain awareness, problem-solving approach, and overall confidence—aggregating these into a composite score out of 100. Additionally, an integrated resume-analysis module examines structure, keyword usage, and relevance to target roles, providing users with a quantified rating and prescriptive recommendations for improvement. In user trials, HiredNext demonstrated its ability to identify both linguistic and content-based weaknesses, yielding an average improvement of 18% in mock-interview scores after three practice sessions. By combining immersive voice interaction with data-driven feedback, HiredNext aims to bridge the gap between self-study and real-world interview readiness, empowering job seekers to enter interviews with enhanced poise and a sharper strategic focus.

1. INTRODUCTION

The job interview remains one of the most consequential—and anxiety-inducing—milestones in a candidate's career journey. Traditional preparation methods (e.g., reading question banks, conducting mock interviews with peers, or self-recording answers) often fall short in recreating the pressure, spontaneity, and verbal nuance of a real hiring conversation. Moreover, most existing platforms focus narrowly on question delivery and answer evaluation without providing truly immersive voice-based interaction or granular, actionable feedback on how answers are communicated. Recognizing this gap, **HiredNext** combines advanced natural language processing, text-to-speech, and speech-to-text technologies to emulate a lifelike interview environment. It not only poses a rich variety of behavioral and technical questions— either in a broad "general" track or customized to top tech employers like Google, Meta, and Microsoft—but also assesses both the substance and delivery of each response. Complementing the verbal interview simulator is a resume-analysis module that evaluates structure, keyword alignment, and relevance, delivering targeted recommendations to help users refine their personal branding. By integrating immersive voice interaction with data-driven scoring across multiple performance dimensions, HiredNext empowers candidates to practice more effectively and build confidence ahead of real-world interviews.

1.1 Problem Statement

While online interview-prep tools and question repositories abound, three critical challenges persist:

1. **Lack of Realistic Voice Simulation**
   Text-only interfaces or prerecorded prompts cannot capture the dynamic give-and-take of live conversation, depriving users of the opportunity to practice tone, pacing, and instant recall under pressure.

2. **Limited, Fragmented Feedback**
   Platforms may rate answer correctness or grammar, but rarely offer a holistic evaluation that covers communication clarity, domain knowledge, problem-solving approach, and confidence—all key factors in hiring decisions.

3. **Disconnected Resume Evaluation**
   Although standalone resume-review services exist, they often require manual uploads

and deliver generic feedback without tying insights back to interview performance or the target employer's expectations.

HiredNext addresses these gaps by delivering a unified, voice-based interview simulator that adapts to both general and company-specific question sets, provides multi-dimensional performance ratings out of 100, and seamlessly incorporates resume analysis—ensuring candidates receive comprehensive, cohesive guidance throughout their preparation journey.

2. BACKGROUND RESEARCH

A breadth of interview-preparation tools has emerged in recent years, each addressing different aspects of candidate readiness. Traditional question banks (e.g., LeetCode, InterviewBit) focus primarily on technical problem-solving practice, offering text-based prompts and automated code grading. Platforms like Pramp and Interviewing.io add a human element by pairing candidates for peer or expert mock interviews, but still rely on video or text chat interfaces that lack seamless, real-time feedback on delivery style. Meanwhile, standalone resume-review services (e.g., TopResume, Resume Worded) apply keyword scanning and formatting checks but do not tie those insights back into interview performance. A common shortfall across these solutions is their fragmentation: candidates must juggle multiple tools to practice content, communication, and resume polish.

Recent advances in speech-based AI have enabled more natural voice interactions in customer service and virtual assistants, but few systems have translated that capability into fully automated, end-to-end interview simulators. Early prototypes demonstrate feasibility—using speech-to-text for answer transcription and NLP for content scoring—but often stop short of providing nuanced, multi-dimensional feedback or tailoring questions to specific employers. HiredNext builds on this foundation by integrating immersive voice dialogue, sophisticated NLP evaluation, and resume analysis into one cohesive platform.

2.1 Proposed System

HiredNext is architected as a modular, microservices-based platform comprising three core components:

1. **Voice Interaction Engine**
   - **Speech Recognition & TTS:** Converts AI-generated questions into natural speech and transcribes user responses in real time using end-to-end ASR models.
   - **Dialogue Manager:** Selects and sequences questions from a general bank or company-specific corpus (e.g., Google, Meta, Microsoft), adapting follow-ups based on user performance.
2. **Assessment & Scoring Module**

- o **Content Analysis:** Leverages transformer-based NLP to evaluate answer relevance, domain knowledge, and problem-solving approach against expected response patterns.
- o **Communication Metrics:** Applies prosodic and fluency analysis—measuring pace, clarity, filler-word usage, and confidence—to generate scores for communication, awareness, and overall delivery.
- o **Composite Rating Engine:** Aggregates per-category metrics into a unified interview score out of 100, with sub-scores broken down by dimension.

3. **Resume Analysis Service**
   - o **Structural Evaluation:** Checks formatting consistency, section completeness, and length appropriateness.
   - o **Keyword & Relevance Checker:** Matches resume content against target role requirements and company-specific jargon.
   - o **Feedback Generator:** Produces actionable recommendations and a normalized resume rating.

All services communicate via RESTful APIs, enabling horizontal scalability and easy integration of new question banks or assessment models. Containerization (Docker/Kubernetes) ensures portability across cloud environments, while a React-based front end provides a polished user experience for both web and mobile.

2.2 Goals and Objectives

The design of HiredNext is driven by the following key objectives:

- **Realistic Voice-Based Simulation:** Emulate the spontaneity and pressure of live interviews, enabling users to practice tone, pacing, and impromptu thinking.
- **Comprehensive Multi-Dimensional Feedback:** Provide detailed ratings on communication clarity, domain awareness, problem-solving methodology, and confidence, rather than a single correctness score.
- **Employer-Specific Customization:** Offer tailored question sets and evaluation criteria for top-tier technology firms, helping candidates prepare for the unique styles of companies like Google and Meta.

- **Integrated Resume & Interview Prep:** Tie resume insights directly to interview performance metrics, giving users a unified preparation workflow.
- **Measurable Performance Improvement:** Track user progress across multiple sessions, aiming for statistically significant score gains (e.g., ≥15% improvement over three practice runs).

3. PROJECT TRACKING

To ensure timely delivery and maintain clear visibility into development progress, HiredNext adopted an Agile-inspired tracking framework with the following elements:

1. **Sprint-Based Planning**
   - **Sprint Duration**: Two-week sprints, each beginning with a planning meeting to define sprint goals, scope, and deliverables.
   - **Backlog Grooming**: Ongoing refinement of user stories in the product backlog, prioritizing features such as new question–answer flows, voice-engine upgrades, or resume-analysis heuristics.
   - **Sprint Review & Retrospective**: At the end of each sprint, the team demos completed functionality (e.g., improved ASR accuracy, updated scoring algorithm) and holds a retrospective to identify process improvements.

2. **Task Management & Issue Tracking**
   - **Tooling**: Jira (or Trello) boards organize tasks into columns—Backlog, To Do, In Progress, In Review, and Done. Each ticket includes clear acceptance criteria, linked pull requests, and time estimates.
   - **Epics & User Stories**: High-level epics (e.g., "Voice Interaction Engine," "Company-Specific Q&A Module") are broken down into user stories that capture developer tasks (e.g., "Integrate Google question corpus," "Benchmark model latency").
   - **Labels & Tags**: Custom labels (e.g., `ASR`, `NLP`, `UI`, `Resume-Analysis`) enable filtering by component and expedite cross-functional coordination.

3. **Progress Metrics & Reporting**
   - **Burndown Charts**: Visualize remaining story points per sprint, helping the team gauge scope creep and adjust priorities mid-sprint if needed.
   - **Velocity Tracking**: Historical velocity (average story points completed per sprint) informs more accurate sprint planning and resource allocation.
   - **Milestone Reviews**: Major project milestones—such as "MVP Voice Interview v1.0," "Resume Analysis v1.0," and "Company-Specific Module v1.0"—are mapped on a Gantt timeline to align with stakeholder demo dates.

4. **Quality Assurance & Continuous Integration**

- o **CI/CD Pipeline**: Automated tests (unit, integration, and end-to-end) are triggered on each merge, with code coverage and performance benchmarks reported.
- o **Automated Monitoring**: For deployed services, dashboards track API latency, error rates, and resource utilization, ensuring that performance regressions are caught early.

5. **Stakeholder Communication**
   - o **Weekly Stand-Ups**: Time-boxed (15-minute) daily check-ins keep the team aligned on blockers and progress.
   - o **Bi-Weekly Demos**: Executives, product owners, and potential users are invited to review working features, providing feedback that feeds directly back into the backlog.
   - o **Documentation Updates**: All design changes, architecture diagrams, and API specs are maintained in a central Confluence (or Notion) workspace, ensuring transparency and onboarding ease.

By coupling sprint-based execution with rigorous metrics and transparent reporting, the HiredNext team maintained focus on both short-term deliverables and long-term vision—allowing iterative improvement of our voice-based interview simulator and resume-analysis capabilities while ensuring predictable, measurable progress.

4. USER INTERFACE

4.1 UI Description

The user interface of HiredNext is designed to be intuitive, clean, and functional, ensuring users have a smooth and interactive experience during their virtual interviews. The system provides a seamless transition between interview sessions, resume analysis, and performance feedback.

Key UI components include:

Interview Interface: A simulated calling screen where the AI interviewer speaks and the user responds verbally. This interface mimics a real-life interview call to reduce nervousness and create realism.

Performance Report Screen: After each session, a detailed analytics screen displays the following:

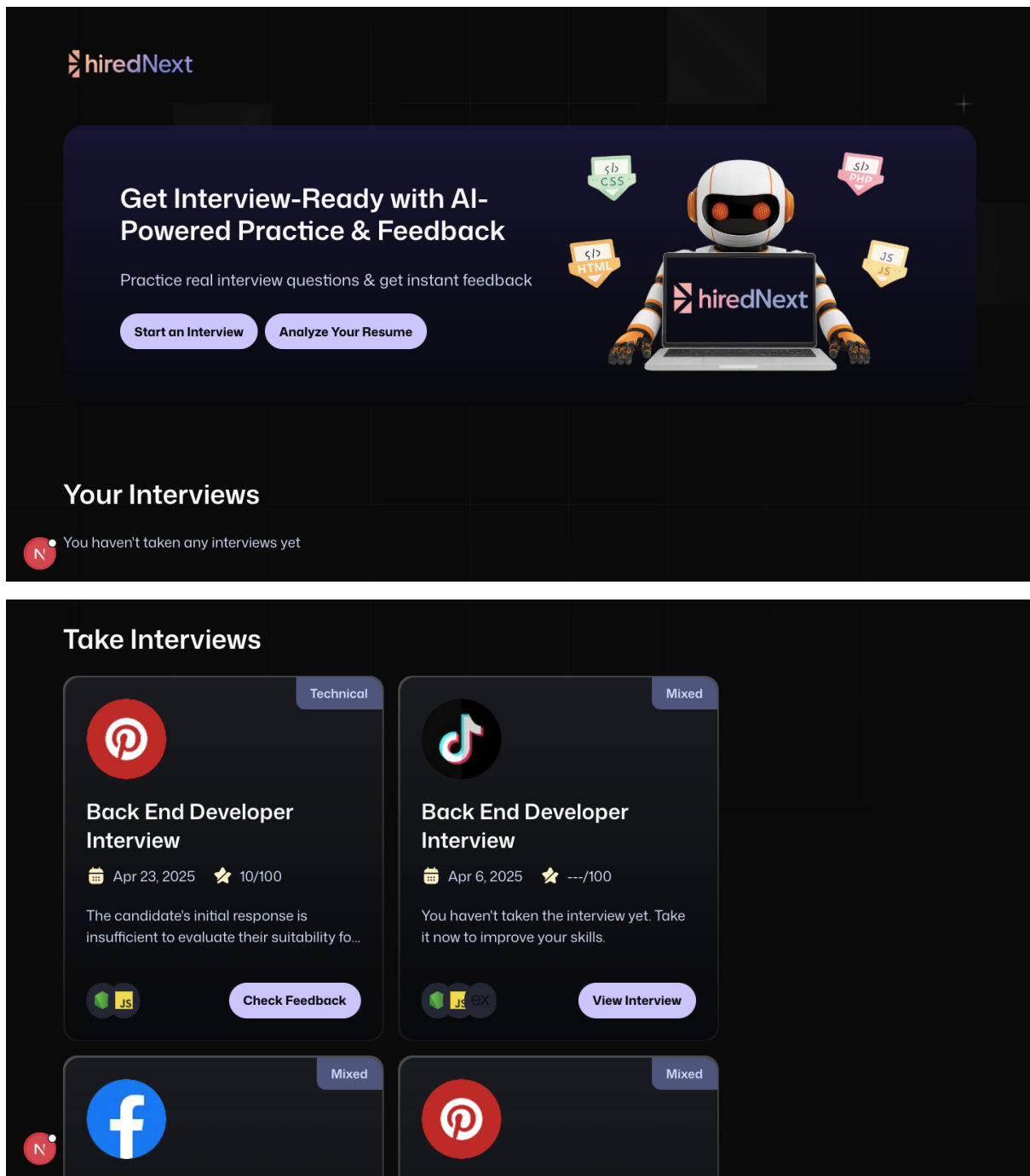> Communication Score
>
> Technical Awareness
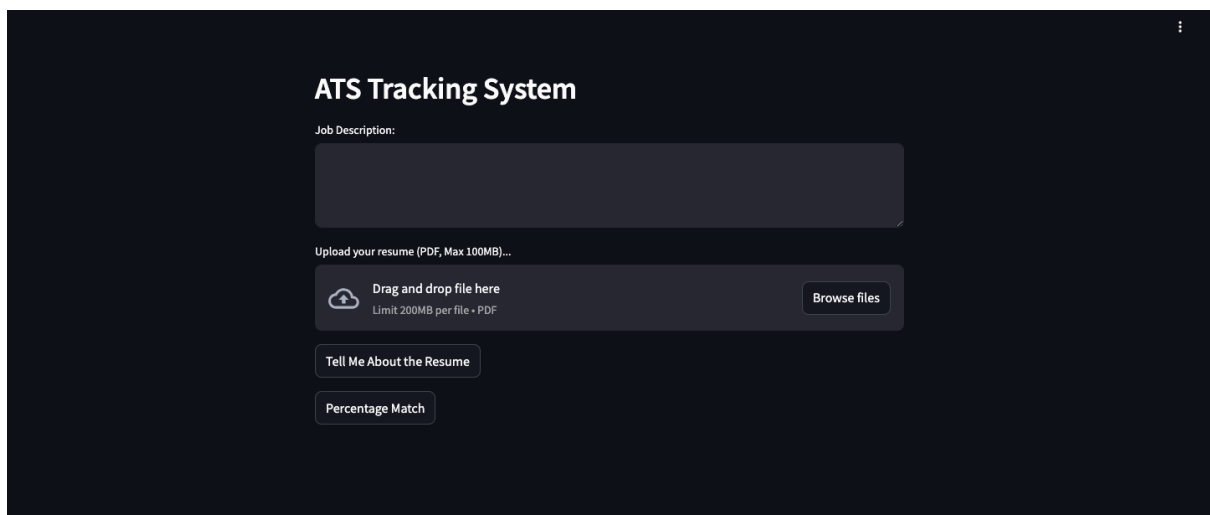>
> Confidence
>
> Overall Interview Score (out of 100)

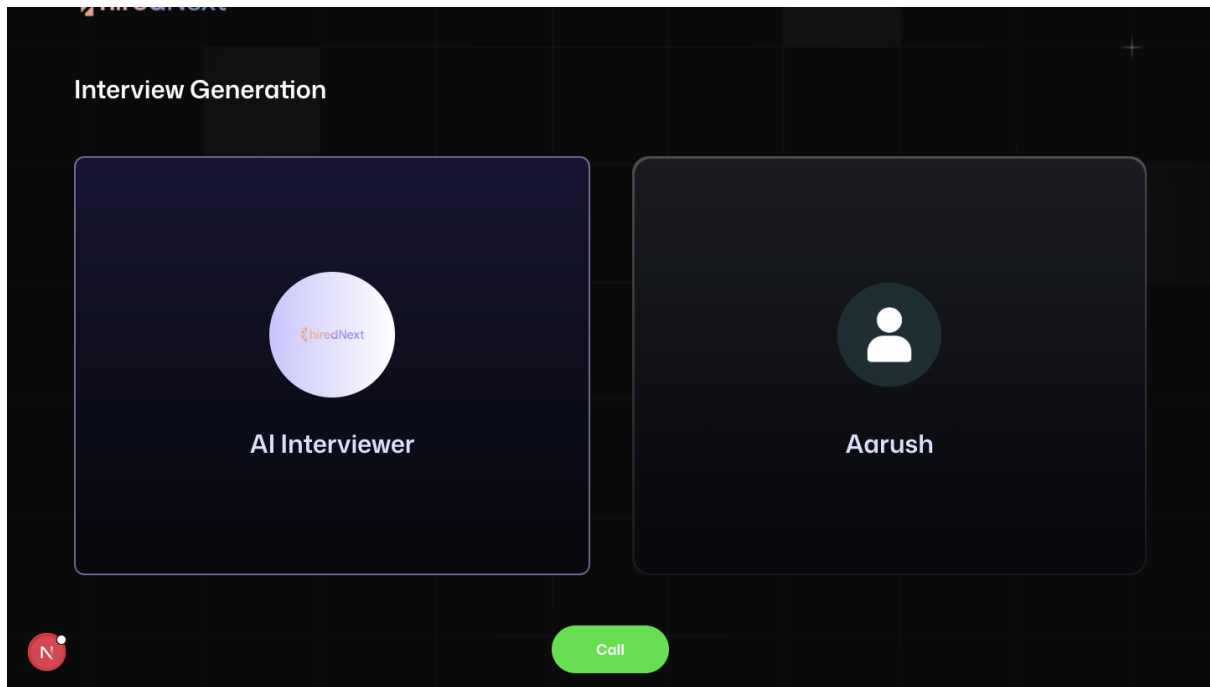Company-Specific Mode: Users can select a company such as Google, Meta, or Quora, and the UI adapts the interview style and questions accordingly.

Resume Analysis Panel: Users upload their resume, and a clean, focused layout presents AI-generated ratings and feedback.

Navigation Bar: Includes buttons to switch between General Interview, Company-Specific Interview, Resume Analysis, and Past Sessions.

4.2 UI Mock-up

Interview Generation

AI Interviewer

Aarush

Call

ATS Tracking System

Job Description:

Upload your resume (PDF, Max 100MB)...

Drag and drop file here
Limit 200MB per file • PDF

Browse files

Tell Me About the Resume

Percentage Match

5. ALGORITHMS / PSEUDO CODE OF CORE FUNCTIONALITY

```tsx
import { isAuthenticated } from "@/lib/actions/auth.action";
import { redirect } from "next/navigation";
import Image from "next/image";
import Link from "next/link";
import React from "react";

const RootLayout = async ({ children }: { children: React.ReactNode }) => {
  const isUserAuthenticated = await isAuthenticated();

  if (!isUserAuthenticated) redirect("/sign-in");

  return (
    <div className="root-layout">
      <nav>
        <Link href="/" className="flex items-center gap-2">
          <Image src="/logo.png" alt="Logo" width={150} height={150} />
        </Link>
      </nav>
      {children}
    </div>
  );
};

export default RootLayout;
import Link from "next/link";
import Image from "next/image";

import { Button } from "@/components/ui/button";
import InterviewCard from "@/components/InterviewCard";

import { getCurrentUser } from "@/lib/actions/auth.action";
import { getInterviewsByUserId, getLatestInterviews } from "@/lib/actions/general.action";

async function Home() {
  const user = await getCurrentUser();

  const [userInterviews, allInterview] = await Promise.all([
    // eslint-disable-next-line @typescript-eslint/no-non-null-asserted-optional-chain
    getInterviewsByUserId(user?.id!),
    // eslint-disable-next-line @typescript-eslint/no-non-null-asserted-optional-chain
    getLatestInterviews({ userId: user?.id! }),
  ]);

  // eslint-disable-next-line @typescript-eslint/no-non-null-asserted-optional-chain
  const hasPastInterviews = userInterviews?.length! > 0;
  // eslint-disable-next-line @typescript-eslint/no-non-null-asserted-optional-chain
  const hasUpcomingInterviews = allInterview?.length! > 0;

  return (
    <>
      <section className="card-cta">
        <div className="flex flex-col gap-6 max-w-lg">
          <h2>Get Interview-Ready with AI-Powered Practice & Feedback</h2>
          <p className="text-lg">
            Practice real interview questions & get instant feedback
          </p>
<div className="flex gap-2">
          <Button asChild className="btn-primary max-sm:w-full">
            <Link href="/interview">Start an Interview</Link>
          </Button>
          <Button asChild className="btn-primary max-sm:w-full">
            <Link href="https://huggingface.co/spaces/Hiteshbhattacharjee13/resume-analyzer" target="_blank" rel="noopener noreferrer">
              Analyze Your Resume
            </Link>
          </Button></div>
        </div>
```

```jsx
        <Image
          src="/robot.png"
          alt="robo-dude"
          width={400}
          height={400}
          className="max-sm:hidden"
        />
      </section>

      <section className="flex flex-col gap-6 mt-8">
        <h2>Your Interviews</h2>

        <div className="interviews-section">
          {hasPastInterviews ? (
            userInterviews?.map((interview) => (
              <InterviewCard
                key={interview.id}
                userId={user?.id}
                interviewId={interview.id}
                role={interview.role}
                type={interview.type}
                techstack={interview.techstack}
                createdAt={interview.createdAt}
              />
            ))
          ) : (
            <p>You haven&apos;t taken any interviews yet</p>
          )}
        </div>
      </section>

      <section className="flex flex-col gap-6 mt-8">
        <h2>Take Interviews</h2>

        <div className="interviews-section">
          {hasUpcomingInterviews ? (
            allInterview?.map((interview) => (
              <InterviewCard
                key={interview.id}
                userId={user?.id}
                interviewId={interview.id}
                role={interview.role}
                type={interview.type}
                techstack={interview.techstack}
                createdAt={interview.createdAt}
              />
            ))
          ) : (
            <p>There are no interviews available</p>
```

6. PROJECT CLOSURE

7.1 Goals / Vision

The vision of **HiredNext** was to create an intelligent and interactive virtual interview platform that helps candidates prepare effectively for real-world job interviews.
The project aimed to:

- Simulate a realistic interview experience via AI-driven voice calls.
- Provide detailed feedback on communication, technical awareness, confidence, and overall performance.
- Allow users to practice **company-specific** interviews tailored to organizations like Google, Meta, and Microsoft.
- Offer **resume analysis** using AI to help users enhance their professional profiles.
- Deliver a user-friendly, accessible platform to help users build interview skills anytime, anywhere.

7.2 Delivered Solution

The final solution successfully meets the initial goals and vision:

- A **working AI interview system** that communicates with users over simulated voice calls.
- A **dynamic scoring system** that evaluates different aspects of the interview and provides an overall rating out of 100.
- A **company-specific interview module** offering question sets tailored to various well-known tech companies.
- A **resume evaluation feature** where users receive AI-generated feedback and improvement suggestions.
- A **Flutter-based frontend** ensuring smooth, mobile-responsive UI with simple navigation and minimal learning curve.
- Integration of **personalized feedback reports** after each interview session.

7.3 Remaining Work

While the core functionality has been delivered, there are a few enhancements and future improvements identified:

- **Real-Time Emotion Analysis**: Integrating facial expression or voice tone analysis to better assess user confidence.
- **Expanded Company Database**: Adding more company-specific interview templates for a wider range of industries.
- **Mock Interview Scheduling**: Allowing users to schedule and plan their mock interviews at specific times.
- **Gamification Features**: Introducing badges, rewards, and leaderboards to boost user motivation.
- **Advanced Resume Suggestions**: Using more sophisticated AI models to not only rate but also suggest rewording and formatting changes.

The current state of **HiredNext** lays a strong foundation for future iterations and scaling to a broader user base.

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