

# S.C.O.U.T. v3: Frontend Architecture & Page Specifications

## System Overview

The S.C.O.U.T. v3 frontend is built using React 18 with TypeScript, featuring a modern, responsive design system with real-time capabilities and advanced AI interactions.

## Technology Stack

- **Framework:** React 18.2.0 with TypeScript 5.1
- **State Management:** Zustand 4.4.0 + React Query for server state
- **Styling:** Tailwind CSS 3.3.0 + Headless UI components
- **Real-time:** Socket.IO client for live updates
- **Charts:** Recharts + D3.js for advanced visualizations
- **Video/Audio:** WebRTC + MediaStream API
- **AI Integration:** OpenAI SDK + Custom WebSocket connections
- **Testing:** Jest + React Testing Library + Cypress E2E

## Page Architecture & Specifications

### 1. CANDIDATE PORTAL

#### 1.1 Authentication & Welcome Pages

##### 1.1.1 Landing Page (/)

```
URL: https://scout.studai.one/  
Purpose: Public landing page for candidate invitations  
Components:  
- Hero section with SCOUT branding  
- Authentication form (email verification)  
- Live assessment statistics  
- Testimonials carousel  
  
Sample Data:  
- Active assessments: 1,247  
- Companies using SCOUT: 156  
- Average completion time: 18 minutes  
- Candidate satisfaction: 4.8/5.0
```

##### 1.1.2 Email Verification (/verify)

Purpose: Secure candidate authentication via unique tokens

Features:

- Token validation with error handling
- Candidate profile preview
- Assessment overview presentation
- Privacy policy agreement

Sample Candidate Data:

```
{
  "candidateId": "CND_2025_001247",
  "name": "Arjun Krishnamurthy",
  "email": "arjun.k@example.com",
  "position": "Senior AI Engineer",
  "company": "StudAI One",
  "assessmentId": "ASS_AI_ENG_20250915_001",
  "estimatedDuration": "25-30 minutes",
  "expiryTime": "2025-09-20T18:00:00Z"
}
```

### 1.1.3 Welcome & Instructions (/welcome)

Purpose: Candidate onboarding and assessment preparation

Features:

- AI Avatar introduction (ALEX)
- Assessment flow explanation
- Technical requirements check
- Practice mode availability

Sample Welcome Data:

```
{
  "aiAvatar": {
    "name": "ALEX",
    "personality": "Professional, encouraging, adaptive",
    "voiceModel": "neural_voice_v3",
    "appearance": "diverse_professional_v2"
  },
  "assessmentOverview": {
    "totalStages": 3,
    "adaptiveQuestions": true,
    "multimodalAnalysis": true,
    "realTimeFeedback": true
  }
}
```

## 1.2 Assessment Interface Pages

### 1.2.1 Round 1: Vision Alignment (/assessment/vision)

Purpose: Cultural fit and vision alignment assessment

Features:

- AI-driven conversational interface
- Real-time response analysis

- Adaptive questioning based on responses
- Progress indicator with time estimation

Sample Questions Data:

```
[
  {
    "id": "VIS_001",
    "type": "open_ended",
    "question": "Describe your ideal work environment and how it aligns with innovation-c",
    "analysisMetrics": ["cultural_fit", "communication_clarity", "value_alignment"],
    "timeLimit": 180,
    "followUpTriggers": ["innovation", "collaboration", "growth"]
  },
  {
    "id": "VIS_002",
    "type": "scenario_based",
    "question": "You're working on a project that requires learning a completely new tech",
    "analysisMetrics": ["adaptability", "learning_agility", "problem_solving"],
    "timeLimit": 240
  }
]
```

### 1.2.2 Round 2: Skills Assessment (/assessment/skills)

#### For Technical Roles - Coding Sandbox:

Purpose: Real-world coding and problem-solving assessment

Features:

- Multi-language IDE with AI assistance monitoring
- Real-time code analysis and pattern recognition
- Collaborative coding scenarios
- Git integration for version control simulation

Sample Technical Challenge:

```
{
  "challengeId": "TECH_AI_001",
  "title": "AI Agent Communication System",
  "description": "Build a multi-agent communication system where agents can share informa",
  "languages": ["Python", "JavaScript", "Go"],
  "frameworks": ["FastAPI", "Node.js", "Gin"],
  "timeLimit": 90,
  "evaluationCriteria": [
    "Code quality and architecture",
    "AI integration approach",
    "Error handling and edge cases",
    "Documentation and testing"
  ],
  "resources": {
    "documentation": true,
    "aiAssistance": "limited",
    "internetAccess": "restricted"
  }
}
```

## For Non-Technical Roles - Simulation Environment:

Purpose: Workplace scenario simulation and decision-making assessment

Features:

- Realistic email/chat interface mockup
- Time-pressured decision scenarios
- Stakeholder interaction simulations
- Multi-tasking capability assessment

Sample Business Simulation:

```
{
  "simulationId": "BIZ_MGT_001",
  "title": "Product Launch Crisis Management",
  "scenario": "A critical bug is discovered 2 hours before a major product launch. You ne",
  "duration": 45,
  "stakeholders": [
    {
      "name": "Sarah Chen",
      "role": "Engineering Lead",
      "personality": "Technical, direct, time-conscious",
      "availability": "Limited"
    },
    {
      "name": "Marcus Johnson",
      "role": "Marketing Director",
      "personality": "Results-driven, communicative, strategic",
      "availability": "Immediately available"
    }
  ],
  "incomingMessages": 12,
  "decisionsRequired": 8,
  "successMetrics": ["Response time", "Decision quality", "Stakeholder satisfaction"]
}
```

### 1.2.3 AI Interview Interface (/assessment/interview)

Purpose: Autonomous AI-conducted behavioral interview

Features:

- Photorealistic AI avatar with natural conversation
- Real-time facial expression and voice analysis
- Adaptive questioning based on candidate responses
- Multi-language support with cultural context

Sample AI Interview Configuration:

```
{
  "aiInterviewer": {
    "avatarId": "PROF_ALEX_V3",
    "personality": {
      "warmth": 85,
      "professionalism": 95,
      "adaptability": 90,
      "empathy": 88
    }
  },
  "voiceSettings": {
```

```

        "tone": "professional_warm",
        "pace": "moderate_adaptive",
        "accent": "neutral_international"
    }
},
"interviewFlow": {
    "warmupQuestions": 2,
    "coreQuestions": 8-12,
    "followUpQuestions": "adaptive",
    "duration": "20-35 minutes"
},
"analysisMetrics": [
    "communication_effectiveness",
    "emotional_intelligence",
    "problem_solving_approach",
    "cultural_alignment",
    "leadership_potential"
]
}

```

## 1.3 Results & Feedback Pages

### 1.3.1 Assessment Completion (/completion)

Purpose: Post-assessment confirmation and next steps

Features:

- Completion confirmation with timeline
- Immediate feedback preview
- Next steps information
- Contact information for queries

Sample Completion Data:

```

{
  "completionTime": "2025-09-15T14:32:45Z",
  "totalDuration": "28 minutes 32 seconds",
  "sectionsCompleted": 3,
  "overallScore": "Detailed analysis in progress",
  "nextSteps": {
    "reviewTimeline": "24-48 hours",
    "contactPerson": "StudAI Talent Acquisition Team",
    "feedbackAvailable": "2025-09-17T10:00:00Z"
  }
}

```

### 1.3.2 Detailed Feedback Report (/feedback)

Purpose: Comprehensive assessment results and development insights

Features:

- Multi-dimensional scoring visualization
- Strengths and development areas identification
- Personalized career advice from AI
- Skill development recommendations

Sample Feedback Data:

```
{
  "overallRating": "Highly Recommended",
  "scores": {
    "technicalCompetency": 88,
    "culturalAlignment": 92,
    "communicationSkills": 85,
    "problemSolving": 90,
    "leadershipPotential": 87,
    "aiCollaborationQuotient": 89
  },
  "strengths": [
    "Exceptional ability to articulate complex technical concepts",
    "Strong adaptability to new technologies and frameworks",
    "Natural inclination towards collaborative problem-solving"
  ],
  "developmentAreas": [
    "Consider strengthening project management methodologies",
    "Explore advanced AI ethics and responsible development practices"
  ],
  "careerRecommendations": {
    "idealRoles": ["Senior AI Engineer", "AI Product Manager", "Technical Lead"],
    "skillGaps": ["Advanced MLOps", "Cross-functional leadership"],
    "learningResources": ["Microsoft AI-900 Certification", "Product Management for AI Sy
  }
}
```

## 2. HR ADMIN DASHBOARD

### 2.1 Authentication & Main Dashboard

#### 2.1.1 Admin Login (/admin/login)

Purpose: Secure HR team authentication

Features:

- Multi-factor authentication (MFA)
- Role-based access control
- Session management with timeout
- Audit trail logging

Sample Admin User:

```
{
  "userId": "ADM_HR_001",
  "name": "Priya Sharma",
  "role": "Senior Talent Acquisition Manager",
  "permissions": ["view_all_assessments", "invite_candidates", "generate_reports"],
  "lastLogin": "2025-09-15T09:15:30Z",
  "mfaEnabled": true
}
```

#### 2.1.2 Main Dashboard (/admin/dashboard)

Purpose: Central overview of hiring activities and analytics

Features:

- Real-time assessment statistics
- Pending actions queue
- Performance metrics overview
- Quick access to key functions

Sample Dashboard Data:

```
{
  "todayStats": {
    "assessmentsCompleted": 23,
    "newInvitations": 45,
    "reportsPending": 8,
    "highScoreCandidates": 12
  },
  "weeklyTrends": {
    "completionRate": 89.2,
    "averageScore": 76.8,
    "topPerformingRole": "AI Engineer",
    "candidateSatisfaction": 4.7
  },
  "upcomingDeadlines": [
    {
      "candidateName": "Raj Patel",
      "position": "Product Manager",
      "deadline": "2025-09-16T17:00:00Z",
      "status": "Awaiting review"
    }
  ]
}
```

## 2.2 Candidate Management Pages

### 2.2.1 Candidate Invitation (/admin/invite)

Purpose: Create and send assessment invitations to candidates

Features:

- Bulk invitation capability
- Custom message templates
- Role-specific assessment assignment
- Automated scheduling and reminders

Sample Invitation Form:

```
{
  "candidateDetails": {
    "name": "Kavya Reddy",
    "email": "kavya.reddy@email.com",
    "phone": "+91-9876543210",
    "position": "UX Designer",
    "experience": "3-5 years",
    "source": "LinkedIn Outreach"
  },
  "assessmentConfig": {
    "template": "UX_DESIGNER_STANDARD",

```

```

    "duration": "30 minutes",
    "validityPeriod": "7 days",
    "language": "English",
    "timezone": "Asia/Kolkata"
  },
  "customization": {
    "personalizedMessage": true,
    "companyBranding": true,
    "interviewerPreference": "ALEX_CREATIVE"
  }
}

```

### 2.2.2 Candidate List & Management (/admin/candidates)

Purpose: Comprehensive candidate tracking and management

Features:

- Advanced filtering and search
- Bulk actions and status updates
- Export capabilities
- Integration with ATS systems

Sample Candidate List:

```

[
  {
    "candidateId": "CND_2025_001248",
    "name": "Ananya Gupta",
    "position": "Data Scientist",
    "status": "Assessment Completed",
    "submissionDate": "2025-09-14T16:45:00Z",
    "overallScore": 91,
    "recommendation": "Highly Recommended",
    "nextAction": "Schedule Follow-up Interview",
    "tags": ["Machine Learning", "Python", "High Potential"]
  },
  {
    "candidateId": "CND_2025_001249",
    "name": "Rohit Kumar",
    "position": "Frontend Developer",
    "status": "In Progress",
    "invitationSent": "2025-09-13T10:30:00Z",
    "progress": "Round 2 - Technical Assessment",
    "estimatedCompletion": "2025-09-15T18:00:00Z",
    "tags": ["React", "TypeScript", "UI/UX"]
  }
]

```

## 2.3 Analytics & Reporting Pages

### 2.3.1 Assessment Analytics (/admin/analytics)

Purpose: Deep insights into assessment performance and trends

Features:

- Interactive charts and visualizations



- Comparative analysis across roles and time periods
- Predictive analytics for hiring outcomes
- Custom report generation

Sample Analytics Data:

```
{
  "performanceMetrics": {
    "averageCompletionTime": "24.5 minutes",
    "completionRate": 87.3,
    "candidateSatisfaction": 4.6,
    "assessmentAccuracy": 91.2
  },
  "roleWiseAnalysis": [
    {
      "role": "AI Engineer",
      "totalAssessments": 156,
      "averageScore": 84.2,
      "topSkills": ["Machine Learning", "Python", "Problem Solving"],
      "hiringSuccess": 89.4
    },
    {
      "role": "Product Manager",
      "totalAssessments": 89,
      "averageScore": 78.6,
      "topSkills": ["Strategic Thinking", "Communication", "Data Analysis"],
      "hiringSuccess": 82.1
    }
  ],
  "trendsAnalysis": {
    "monthlyGrowth": 23.5,
    "qualityImprovement": 15.8,
    "timeToHireReduction": 45.2
  }
}
```

### 2.3.2 Detailed Candidate Report (/admin/reports/[candidateId])

Purpose: Comprehensive candidate evaluation report

Features:

- Multi-dimensional scoring breakdown
- Behavioral analysis insights
- AI-generated recommendations
- Comparison with role benchmarks

Sample Detailed Report:

```
{
  "candidate": {
    "name": "Arjun Krishnamurthy",
    "position": "Senior AI Engineer",
    "assessmentDate": "2025-09-15T14:32:45Z"
  },
  "executiveSummary": "Arjun demonstrates exceptional technical competency with strong al",
  "detailedScoring": {
    "technicalSkills": {
      "score": 88,
```

```

      "breakdown": {
        "codingProficiency": 90,
        "systemDesign": 85,
        "aiMlKnowledge": 92,
        "bestPractices": 86
      }
    },
    "behavioralAssessment": {
      "score": 89,
      "breakdown": {
        "communicationClarity": 87,
        "collaborationStyle": 91,
        "adaptability": 88,
        "innovationMindset": 90
      }
    }
  },
  "aiInsights": {
    "culturalFit": "Excellent match - shows strong alignment with StudAI's values of innovation and collaboration",
    "performancePrediction": "High likelihood of success in senior technical roles with 85% confidence",
    "retentionForecast": "85% probability of 3+ year retention based on behavioral patterns"
  },
  "recommendations": {
    "hiringDecision": "Strongly Recommend",
    "optimalRole": "Senior AI Engineer - Autonomous Systems Team",
    "onboardingFocus": ["Advanced MLOps practices", "Cross-functional collaboration"],
    "careerPath": "Technical Lead trajectory within 18-24 months"
  }
}

```

## 2.4 System Configuration Pages

### 2.4.1 Assessment Templates (/admin/templates)

Purpose: Manage and customize assessment templates for different roles

Features:

- Template library with version control
- Custom question banks
- AI behavior configuration
- A/B testing capabilities

Sample Template Configuration:

```

{
  "templateId": "AI_ENG_SENIOR_V3",
  "name": "Senior AI Engineer Assessment",
  "version": "3.2",
  "lastUpdated": "2025-09-10T14:20:00Z",
  "sections": [
    {
      "sectionId": "technical_depth",
      "name": "Technical Deep Dive",
      "weight": 40,
      "duration": 35,
      "questionBank": "AI_ENGINEERING_ADVANCED",
      "adaptiveQuestioning": true
    }
  ]
}

```

```

    },
    {
      "sectionId": "system_design",
      "name": "System Architecture",
      "weight": 30,
      "duration": 25,
      "format": "whiteboard_coding",
      "complexityLevel": "senior"
    }
  ],
  "aiConfiguration": {
    "personalityProfile": "technical_mentor",
    "adaptationLevel": "high",
    "feedbackStyle": "constructive_detailed"
  }
}

```

### 2.4.2 System Settings (/admin/settings)

Purpose: Global system configuration and customization

Features:

- Branding and customization options
- Integration settings
- Notification preferences
- Security and compliance settings

Sample Settings:

```

{
  "brandingConfig": {
    "companyLogo": "https://cdn.studai.one/logo.png",
    "primaryColor": "#2563EB",
    "secondaryColor": "#F59E0B",
    "emailTemplates": "custom_studai_v2"
  },
  "integrationSettings": {
    "atsIntegration": {
      "provider": "Greenhouse",
      "apiKey": "encrypted_key_gh_001",
      "syncEnabled": true
    },
    "emailService": {
      "provider": "SendGrid",
      "templates": ["invitation", "completion", "feedback"]
    }
  },
  "assessmentDefaults": {
    "validityPeriod": 7,
    "reminderSchedule": [24, 2],
    "autoArchive": 90,
    "language": "English"
  }
}

```

## 3. REAL-TIME MONITORING PAGES

### 3.1 Live Assessment Monitor (/admin/live)

Purpose: Real-time monitoring of ongoing assessments

Features:

- Live candidate progress tracking
- Real-time performance indicators
- Intervention capabilities for technical issues
- Quality assurance monitoring

Sample Live Data:

```
{
  "activeAssessments": [
    {
      "candidateId": "CND_2025_001250",
      "name": "Sneha Patel",
      "position": "DevOps Engineer",
      "currentSection": "Technical Problem Solving",
      "progress": 68,
      "timeRemaining": "12 minutes",
      "performanceIndicators": {
        "engagementLevel": "High",
        "responseQuality": "Above Average",
        "technicalAccuracy": "Excellent"
      },
      "flags": []
    }
  ],
  "systemMetrics": {
    "activeConnections": 23,
    "serverLoad": 34,
    "responseTime": "120ms",
    "errorRate": 0.02
  }
}
```

## 4. MOBILE-RESPONSIVE FEATURES

### 4.1 Mobile Candidate Experience

Features:

- Touch-optimized interface for assessments
- Voice input capabilities for mobile devices
- Progressive Web App (PWA) functionality
- Offline capability for basic sections

Mobile Optimizations:

- Gesture-based navigation
- Auto-save functionality every 30 seconds
- Mobile camera integration for video responses
- Adaptive UI based on screen size and orientation

## 4.2 Mobile Admin Dashboard

Features:

- Quick approval workflows
- Push notifications for urgent actions
- Mobile-friendly analytics dashboards
- Voice-to-text for quick notes and feedback

Sample Mobile Admin Interface:

```
{
  "quickActions": [
    "Review pending assessments",
    "Send bulk invitations",
    "Generate daily report",
    "Check system status"
  ],
  "notifications": [
    {
      "type": "high_score_alert",
      "message": "Exceptional candidate completed AI Engineer assessment",
      "priority": "high",
      "timestamp": "2025-09-15T16:45:00Z"
    }
  ]
}
```

## UI/UX Design System

### Design Principles

- **Accessibility First:** WCAG 2.1 AA compliance
- **Mobile-Responsive:** Mobile-first design approach
- **Performance Optimized:** Sub-3-second load times
- **AI-Human Balance:** Clear distinction between AI and human interactions

### Component Library

- Button variants: Primary, Secondary, Outline, Ghost
- Form components: Input, Select, Textarea, FileUpload
- Data display: Table, Card, Stats, Progress indicators
- Navigation: Sidebar, Breadcrumb, Pagination
- Feedback: Toast, Modal, Alert, Tooltip

## Color Palette

- Primary: #2563EB (StudAI Blue)
- Secondary: #F59E0B (Accent Gold)
- Success: #10B981 (Green)
- Warning: #F59E0B (Orange)
- Error: #EF4444 (Red)
- Neutral: #6B7280 (Gray)

This comprehensive frontend specification provides the foundation for building a world-class candidate assessment platform that combines cutting-edge AI capabilities with exceptional user experience design.