

An Austin, Texas, USA-based company that provides in-clinic and remote cognitive care. Helping clinicians screen, assess, and care for patients with confidence since 2015.

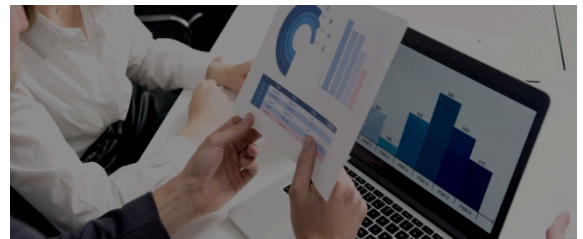
Transforming Cognitive Health Through Proven Science

### Engagement Overview

Crownstack, a leading technology solutions provider, engaged Braincheck in 2025 as its Staff Augmentation Partner to serve as its technical Engineering Partner, revamping and continuously improving its existing products to deliver a better user experience and make them more structured, scalable, and responsive.

### About the Customer

BrainCheck is a digital health company focused on improving cognitive health. The BrainCheck Platform gives you a complete set of tools for checking cognitive health, spotting early signs of decline, and creating personalised care plans—available anytime and anywhere. Founded by experts like David Eagleman, PhD, their user-friendly solutions move beyond traditional methods and make cognitive care accessible on any device. Many top healthcare providers trust their validated digital assessments and care planning tools, which seamlessly integrate into their workflows and deliver clear insights.



Industry	Software Development
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### Business Challenges

- 1. Healthcare providers, especially Primary Care Physicians (PCPs), face increasing pressure to deliver timely, high-quality care while managing complex patient cases. Key challenges include:**
  - **Limited access to specialists:** PCPs often struggle to get timely specialist input, leading to delays in diagnosis and treatment.
  - **Inefficient consultation workflows:** Traditional referral and consultation processes are manual, fragmented, and time-consuming.
  - **Fragmented care plan workflows:** Creating, tracking, and managing care plans for patients and caregivers is manual and unstructured.

- **Lack of structured clinical communication:** Case discussions, assessments, and recommendations are often scattered across emails, PDFs, or unstructured notes.
- **Scalability and auditability issues:** Existing systems lack proper tracking, audit trails, and standardised workflows for medical consultations.
- **Growing demand for cognitive and care management assessments:** Increasing patient volume makes it difficult to manage assessments and follow-ups efficiently.
- **Lack of standardised assessments:** Cognitive assessments, screeners, and severity ratings are scattered across different systems, with no proper tracking.
- **Caregiver engagement gaps:** Caregivers need structured tools to report on patient activities, behaviours, and daily living capabilities; to assess cognitive function; and to identify early signs of dementia, MCI, and other cognitive conditions.
- **Scalability and compliance:** Managing increasing patient volumes while maintaining audit trails and regulatory compliance is complex.
- **Complex multi-stakeholder workflows:** Coordinating assessments between patients, caregivers, and providers requires structured communication.

## Business Solution

**The Crownstack team worked across multiple platforms to address challenges and deliver the best possible care to the patient.**

1. The **eConsult platform** provides a secure, structured, and scalable digital consultation workflow that connects PCPs with specialists. This solution reduces turnaround time, improves collaboration, and standardises the consultation process.

### Key solution components include:

- **Structured case creation:** PCPs can create consultation cases with patient details, assessments, symptoms, and clinical questions.
- **Asynchronous specialist consultation:** Specialists can review cases and respond without requiring real-time scheduling.
- **Assessment and severity tracking:** Cognitive scores, severity levels, and structured assessments are stored and reused across the care journey.
- **Care plan generation:** Specialists (or AI-assisted workflows) can generate structured care plans and follow-up recommendations.
- **Audit and traceability:** Every significant action (case creation, responses, attachments, closures) is logged for compliance and quality assurance.
- **Attachments and document handling:** Secure upload and processing of supporting clinical documents.

2. The **Aegis platform** provides a comprehensive digital solution for cognitive assessment and care management, connecting patients, caregivers, and healthcare providers. This solution reduces assessment time, improves care coordination, and standardises cognitive care workflows across the patient journey.

#### Key Apps in Umbrella

- Cortex – Core business logic, data models, and API
- Hyper – Patient-facing assessment delivery application
- Gyrus – Integration layer for EHR systems and external partners
- Provider – Provider portal for order management and results review

#### Key solution components include:

- **Cognitive assessment batteries:** Standardised cognitive tests (BrainCheck Assess, BrainCheck Screen) for detecting cognitive impairment.
  - **Care plan generation and management:** Structured care plans for patients and caregivers with severity-based recommendations (MCI, dementia, GUIDE protocols).
  - **Multi-audience order workflows:** Separate assessments and screeners for patients, caregivers, and providers with role-based access.
  - **Caregiver assessments:** Tools for caregivers to report on patient functioning (Caregiver Profile, IADL, DSRS, safety checklists, burden assessments).
  - **Access code system:** Secure, time-limited access codes for patients and caregivers to complete remote assessments.
  - **Psychosocial screening:** Depression (GDS), anxiety (GAD-7), PTSD, and other mental health assessments integrated into cognitive care.
  - **Results and scoring engine:** Automated scoring, severity classification, and impression generation for clinical decision support.
  - **Audit and compliance:** Complete traceability of orders, assessments, access codes, and care plan actions.
  - **EHR integration:** Bidirectional data exchange with electronic health records via HL7/FHIR standards.
3. The **BrainCheck Web Application** is a comprehensive cognitive assessment and care-planning platform that offers the following solutions.
    - **Cognitive Assessment Batteries**
    - **Clinical Screeners: A comprehensive suite of validated clinical screening tools**
    - **Care Planning Module: Comprehensive care plan generation**
    - **Remote Testing Capabilities**
    - **Clinical Reporting & Documentation**
    - **Organisation & User Management**
    - **Protocol Management**
    - **Integration Capabilities**

4.

#### Technology Stack

<b>Frontend</b>	<ul style="list-style-type: none"> <li>● Next.js (React) – Server-side rendering and performant web UI</li> <li>● TypeScript – Type-safe frontend and backend development</li> <li>● Tailwind CSS – Consistent, responsive UI styling</li> <li>● Phoenix LiveView – Real-time, server-rendered UI components</li> <li>● React - 18.2.0</li> <li>● Stimulus &amp; Turbo Rails - 8.0</li> <li>● Bootstrap –5.3</li> <li>● Materialise CSS - 2.2</li> </ul>
<b>Backend</b>	<ul style="list-style-type: none"> <li>● Node.js – Backend runtime</li> <li>● Next.js API Routes – Backend APIs</li> <li>● Prisma ORM – Database schema management and data access</li> <li>● Elixir/Phoenix – Scalable, fault-tolerant backend framework</li> <li>● Ecto – Database ORM and schema management</li> <li>● PostgreSQL – Primary data store with multi-tenant architecture</li> <li>● Ruby - 3.3.x</li> <li>● Rails - 7.1.5</li> <li>● Redis &amp; Sidekiq</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>● <b>Multi-tenant architecture</b> – Account-based data isolation with PostgreSQL schemas</li> <li>● <b>Event-driven workflows</b> – PubSub for order lifecycle events and notifications</li> <li>● <b>Sanity CMS</b> – Content management for screeners and assessment configurations</li> <li>● <b>SendGrid</b> – Email delivery for notifications and access codes</li> <li>● <b>Sentry</b> – Error tracking and monitoring</li> <li>● <b>Authentication &amp; Authorization</b> <ul style="list-style-type: none"> <li>○ Devise- User authentication</li> <li>○ Doorkeeper- OAuth 2.0 provider</li> <li>○ Doorkeeper-JWT- JWT token generation</li> <li>○ Pundit- Authorisation policies</li> <li>○ Rolify- Role management</li> <li>○ WorkOS- Enterprise SSO</li> <li>○ Ruby-SAML- SAML authentication</li> <li>○ reCAPTCHA- Bot protection</li> </ul> </li> <li>● <b>Cloud &amp; Infrastructure</b> <ul style="list-style-type: none"> <li>○ AWS S3- File storage (reports, logos, documents)</li> <li>○ AWS Lambda- Serverless functions</li> <li>○ AWS SNS- Push notifications</li> <li>○ Docker- Containerization</li> <li>○ Kubernetes- Container orchestration (K8s Dockerfile)</li> <li>○ Unicorn- Production web server</li> </ul> </li> <li>● <b>Monitoring &amp; Observability</b> <ul style="list-style-type: none"> <li>○ Sentry- Error tracking and monitoring</li> <li>○ Skylight- Performance monitoring</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ PgHero- PostgreSQL performance dashboard</li> <li>○ Notable- Request/job tracking</li> <li>○ AuthTrail- Login activity tracking</li> <li>● <b>Background Processing &amp; Scheduling</b> <ul style="list-style-type: none"> <li>○ Sidekiq- Async job processing</li> <li>○ Whenever- Cron job scheduling</li> </ul> </li> <li>● <b>Admin &amp; Management</b> <ul style="list-style-type: none"> <li>○ ActiveAdmin- Admin dashboard</li> <li>○ Flipper- Feature flags</li> </ul> </li> <li>● <b>Testing &amp; Quality</b> <ul style="list-style-type: none"> <li>○ RSpec- Testing framework</li> <li>○ Capybara- Integration testing</li> <li>○ Factory Bot- Test data generation</li> <li>○ VCR/WebMock- HTTP request mocking</li> <li>○ SimpleCov/Coveralls- Code coverage</li> <li>○ RuboCop- Code linting</li> <li>○ Brakeman- Security scanning</li> </ul> </li> <li>● <b>API &amp; Documentation</b> <ul style="list-style-type: none"> <li>○ Apipie- API documentation</li> <li>○ Active Model Serializers- JSON serialisation</li> <li>○ Rack-CORS- Cross-origin resource sharing</li> </ul> </li> </ul>
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## Business Outcome

The **eConsult platform** delivers measurable value to healthcare organisations:

- **Faster specialist response times:** Reduced wait times compared to traditional referrals.
- **Improved care quality:** Structured data and standardised workflows enable better clinical decision-making.
- **Operational efficiency:** Less administrative overhead and manual coordination.
- **Scalability:** Ability to handle increasing case volumes without linear increases in staffing.
- **Audit readiness and compliance:** Clear traceability of clinical actions and decisions.
- **Foundation for AI-assisted care:** Structured data enables future AI-driven insights and care plan generation.

Overall, eConsult transforms specialist consultations into a **streamlined, secure, and scalable digital workflow** that improves outcomes for both clinicians and patients.

The **Aegis platform** delivers measurable value to healthcare organisations:

- **Faster cognitive screening:** Remote, self-administered assessments reduce clinic visit requirements and wait times.

- **Improved care quality:** Standardised assessments and structured care plans lead to better clinical decisions and earlier interventions.
- **Caregiver empowerment:** Structured tools help caregivers participate meaningfully in patient care and communicate concerns effectively.
- **Operational efficiency:** Automated workflows, scoring, and notifications reduce administrative burden on clinical staff.
- **Scalability:** Multi-tenant architecture supports thousands of providers and patients without linear infrastructure costs.
- **Regulatory compliance:** Complete audit trails, HIPAA-compliant data handling, and standardised clinical protocols.
- **Clinical insights:** Structured data enables longitudinal tracking, population health analytics, and AI-assisted care recommendations.
- **Revenue enablement:** Supports reimbursable cognitive care management (CCM) and chronic care management (CCP) billing codes.

Overall, Aegis transforms cognitive assessment and care management into a streamlined, evidence-based digital workflow that improves outcomes for patients, caregivers, and healthcare providers while supporting value-based care models.

The **BrainCheck web platform** delivers measurable value to healthcare organisations:

- **Streamlined Cognitive Assessment Workflow**
  - Reduced assessment administration time from manual paper-based tests
  - Standardised scoring eliminates human calculation errors
  - Automated percentile ranking against normative population data
- **Enhanced Clinical Documentation**
  - Auto-generated clinical snippets ready for EHR copy/paste
  - CPT code-compliant documentation for reimbursement
  - Comprehensive clinical reports with interpretation guidance
- **Improved Patient Care**
  - Early detection of cognitive impairment through standardised screening
  - Longitudinal tracking enables monitoring of cognitive decline or improvement
  - Care plans provide actionable recommendations for patients and caregivers
- **Operational Efficiency**
  - Multi-organisation support enables scaling across healthcare systems
  - Role-based access ensures appropriate data visibility
  - Remote testing reduces in-clinic visit requirements
- **Revenue Optimization**
  - Proper CPT code documentation supports billing compliance
  - Subscription-based model with usage tracking
  - Support for multiple plan types (Free, Personal, Business, Research)
- **Compliance & Security**
  - **HIPAA-compliant data handling**

- **Secure authentication with SSO support**
- **Audit trail for login activities**
- **Soft-delete (paranoid) for data retention compliance**
- **V1** was designed for the following target segments:
  - Clinicians/Provider: Efficient cognitive screening, automated reporting, and billing documentation
  - Test Administrators: Easy test administration, patient management, group organisation
  - Healthcare Organizations: Multi-provider support, usage analytics, protocol standardisation
  - Patients/Test Takers: Remote testing convenience, secure access, progress tracking
  - Caregivers: Support resources, care plan access, stress assessment

#### Further Links

- [Learn More About Crownstack's Offerings](#)
- [Learn More about Braincheck](#)