HITLAB

BlockHaven™

Sovereign Health Memory: An Independent HITLAB Evaluation of BlockHaven's Pre-Launch Health Intelligence Platform

AN EVALUATION BY HITLAB

This report presents HITLAB's independent evaluation of BlockHaven, a next-generation health intelligence platform that is designed to unify identity, data, and intelligence to establish continuous, individual-owned health memory through HealthMemory™ — addressing the fragmentation and inefficiencies that define modern healthcare ecosystems.

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EXECUTIVE SUMMARY

This white paper presents the findings of HITLAB's independent heuristic evaluation of the BlockHaven platform, conducted at the pre-launch stage to assess the usability, design, and interaction model of the platform across both the individual and clinician experiences.

BlockHaven is a pre-launch digital health platform designed to establish persistent, sovereign, individual-anchored health memory through its core product, HealthMemory™. It serves both individuals and clinicians; the platform unifies longitudinal health data, ambient clinical capture, and AI-driven decision support within a single consent-based architecture, addressing one of healthcare's most entrenched structural failures: the absence of continuous health data that travels with the individual across providers, settings, and time.

HITLAB conducted a heuristic evaluation of the BlockHaven platform across both the individual and clinician experiences, assessing the pre-launch demo against Nielsen's ten established usability heuristics. The evaluation involved reviewing pre-launch build spanning onboarding, the home dashboard, health insights, live visit recording, clinician check-in, and the HealthMemory™ vault.

The evaluation was carried out by a multidisciplinary team of usability experts and digital health specialists, applying a structured review methodology to identify friction points, design inconsistencies, and opportunities for improvement before full-scale launch. Each heuristic was assessed independently across both the individual-facing and clinician-facing experiences, enabling a comparative analysis of how well the platform serves its two distinct user populations. Findings were documented with severity ratings to help the BlockHaven team prioritize remediation efforts in alignment with both user needs and clinical workflow demands.

This paper is intended to serve as a foundational usability reference for the BlockHaven product and design teams as they advance from the pre-launch stage into iterative build cycles. The insights and recommendations contained herein reflect best practices in human-centered design and digital health usability standards, and are aimed at supporting BlockHaven in delivering a platform experience that is not only clinically robust but also intuitive, accessible, and trustworthy for all end users.

BlockHaven is a digital health platform designed to establish persistent, sovereign, individual-anchored health memory through its core product, HealthMemory™.

It serves both individuals and clinicians; the platform unifies longitudinal health data, ambient clinical capture, and AI-driven decision support within a single consent-based architecture.

BlockHaven addresses one of healthcare's most entrenched structural failures: the absence of continuous health data that travels with the individual across providers, settings, and time.

The evaluation involved reviewing pre- developed wireframes spanning onboarding, the home dashboard, health insights, live visit recording, clinician check-in, and the HealthMemory vault. The platform demonstrates strong conceptual foundations, including a conversational onboarding experience, a clear clinical value proposition, and a compelling data sovereignty model. Key usability opportunities were identified across visibility of system status, user control and freedom, error prevention, and information hierarchy. With its strong foundation, clinical relevance, and unwavering focus on individual data sovereignty, BlockHaven is well-positioned to become an indispensable tool in modern healthcare — trusted by individuals, adopted by clinicians, and built to deliver lasting value across the full continuum of care.

Healthcare Intelligence Challenge

Fragmentation of Clinical Data Systems

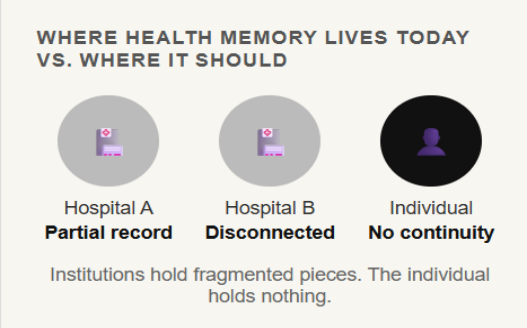
Health systems do not maintain a canonical representation of individual health states over time. What exists instead are institution-scoped records and narrative artifacts optimized for local objectives — mutable, partially ordered, and authority-shifting.

As automation increases, these properties amplify distortion: interpretations persist as facts, temporary conditions become durable attributes, and downstream systems cannot distinguish correction from revision.

There is no canonical health state. Systems fail despite abundant data because memory is anchored in the wrong place — institutions, not individuals. (BlockHaven, HealthMemory Papers 001: Canonical Health State, A Systems Primitive, Feb 2026)

- Without access to the complete patient history
- Across siloed systems that fail to communicate

Health data is distributed across EHRs, labs, wearable platforms, and patient-reported inputs—yet lacks a unified structure or continuity layer.



The Absence of Longitudinal Health Memory

Institutional memory is episodic by design. Records reflect organizational priorities — compliance, billing, accountability — not the longitudinal biological narrative of the patient. At every transition between systems, context fragments. This is not a failure of execution; it is an architectural property. Human physiology operates on no such schedule. Biological state evolves continuously, sampled only intermittently by clinical encounters.

The result is a persistent informational deficit at the point of care: clinicians reconstruct histories from heterogeneous, partially ordered records of variable provenance; patients supply anamnesis from recall; contradictions go unresolved. Clinical decisions are made under conditions of chronic incompleteness. (BlockHaven, HealthMemory Papers 002: Individual-Anchored Truth, Feb 2026)The gap is not addressable through additional interoperability standards or system integration layers. The constraint is more fundamental: there is no persistent, authoritative, individual-anchored health state — no substrate that accumulates longitudinal biological data over time, maintains integrity across institutional transitions, and preserves authorship with the subject rather than with transient custodians.

The constraint is not addressable through interoperability standards or integration layers. No persistent, authoritative, individual-anchored health state exists — no substrate that accumulates longitudinal data over time, maintains integrity across transitions, and preserves authorship with the subject. Without it, clinical intelligence remains episodic: reconstructive rather than continuous, reactive rather than anticipatory.

Key Statistics	
72% of patients see 3 or more providers — each holding a different, incomplete version of their health story	1 in 3 medical errors are attributed to missing or inaccessible patient history at point of care
86% of physicians report that lack of longitudinal data negatively affects clinical decision-making	$935B in annual U.S. healthcare waste is linked to care fragmentation, duplicated tests, and missing records

Unmet Needs and Structural Gaps

Healthcare transformation continues to be constrained by deep-rooted structural inefficiencies that limit continuity, intelligence, and patient-centric care. These gaps are not isolated—they are interconnected failures of system design.

1. Fragmented Data Ecosystem

Healthcare data is distributed across multiple providers, platforms, and formats—including hospitals, labs, wearables, and patient-reported systems. These systems often lack interoperability, preventing seamless data exchange and integration. As a result, clinicians operate with incomplete information, and patients must repeatedly share their medical history. This fragmentation not only reduces efficiency but also increases the risk of misdiagnosis, duplicated tests, and delayed care.

2. Absence of Longitudinal Continuity

Healthcare systems are designed around episodic interactions rather than continuous tracking of an individual's health over time. There is no unified timeline that captures the evolution of a patient's condition, treatments, and outcomes. This absence of longitudinal continuity forces both clinicians and patients to reconstruct past events, limiting the ability to identify patterns, predict risks, and deliver proactive care.

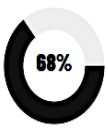
3. Limited Patient Ownership

In most healthcare systems, patient data is owned and controlled by institutions such as hospitals, insurers, or digital platforms. Individuals have limited access, visibility, or control over how their data is used or shared. This lack of ownership reduces transparency, restricts portability, and creates dependency on institutional systems. As a result, patients are disconnected from their own health data, limiting engagement and informed decision-making.

4. Absence of Consent-Bound Data Architecture

Health data sharing today is governed by compliance frameworks rather than by a structural consent architecture. Individuals cannot grant or revoke scoped access to specific data streams in real time. The result is a binary — either full institutional access or none — which creates both over-sharing and under-sharing, reducing trust and limiting appropriate clinical utility.

Individuals reporting their health record is incomplete or inaccessible across providers (JAMA, 2024)

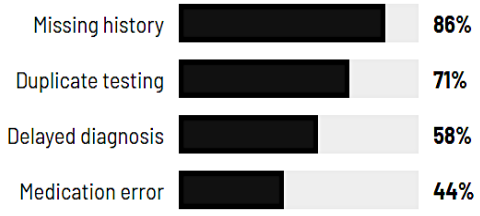


Fragmented record

Complete access

68% cannot access a complete, unified health record across all providers.

% of clinicians reporting decisions impaired by missing longitudinal data (BlockHaven / NEJM, 2025)



Unmet Needs and Structural Gaps

5. Rewrite Collapses Causality

Current EHR architectures permit overwriting of prior health state. Systems that allow rewrite cannot distinguish correction from fabrication. HealthMemory™ addresses this by enforcing append-only assertions: corrections produce new records, while prior state remains permanently intact and verifiable, preserving causality over time (BlockHaven, 2026).

6. Ambient Clinical Capture Is Absent

Healthcare systems are designed around episodic interactions rather than continuous tracking of an individual's health over time. There is no unified timeline that captures the evolution of a patient's condition, treatments, and outcomes. This absence of longitudinal continuity forces both clinicians and patients to reconstruct past events, limiting the ability to identify patterns, predict risks, and deliver proactive care.

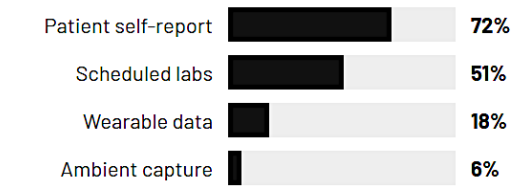
7. Population Intelligence Requires Sovereign Contribution

Aggregate health intelligence today is derived from institutional data aggregated without explicit individual consent, creating surveillance risk and eroding trust. BlockHaven's consent-based architecture enables population-level insight to emerge from sovereign individual contributions — no central data repository, no extraction — allowing genuine collective benefit while preserving individual control (BlockHaven, 2026).

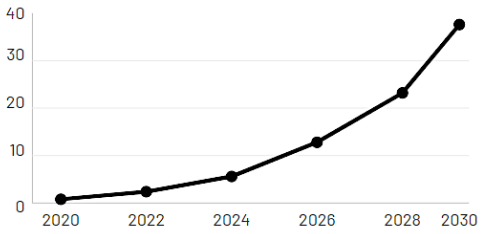
8. Provenance and Traceability Gaps

In current architectures, assertions about health state often lose their provenance — who asserted them, under what authority, and in what context. Without provenance, automated systems cannot distinguish observational fact from interpreted inference. As AI integration deepens, this gap creates compounding risk: interpretations may be treated as canonical substrate, leading to systemic distortion at scale.

Primary method by which clinicians detect health changes between visits (FCA, 2024)



Projected growth in health data volume per individual (zettabytes, est. 2020–2030)



Economic and Operational Burden of Fragmentation

Fragmentation across healthcare systems imposes significant clinical, operational, and financial burdens, limiting the ability to deliver efficient and high-quality care. As patient data is dispersed across multiple, non-interoperable platforms, healthcare providers are forced to operate within incomplete information environments—leading to inefficiencies that scale across the entire system.

One of the most immediate consequences of fragmentation is the duplication of diagnostics and administrative processes. When prior records are inaccessible or incomplete, clinicians often repeat laboratory tests, imaging, and documentation workflows. This not only increases healthcare costs but also places unnecessary burden on patients and providers.

Additionally, fragmented data environments contribute to delayed interventions and increased hospitalizations. Without real-time visibility into a patient's evolving health status, early warning signs are often missed, resulting in acute episodes that require more intensive—and expensive—care.

Care coordination also suffers significantly. Patients interacting with multiple providers must navigate disconnected systems, while clinicians lack a unified view of treatment plans, medications, and history. This leads to inefficient workflows, miscommunication, and gaps in continuity, all of which impact clinical outcomes.

At a system-wide level, these inefficiencies translate into escalating costs, workforce strain, and declining care quality. Clinicians spend substantial time on administrative tasks and data reconciliation rather than patient care, contributing to burnout and reduced productivity. Ultimately, fragmentation undermines both economic sustainability and patient outcomes, making the absence of a continuous intelligence layer not just a technical limitation, but a critical systemic constraint.

> *Fragmentation is not just a data problem—it is a **cost multiplier, a workflow disruptor, and a clinical risk factor**.*

30% of medical tests are duplicated

Administrative costs account for ~25–30% of total U.S. healthcare spending

Poor care coordination contributes to nearly 20% of hospital readmissions

Clinicians spend up to 50% of their time on administrative tasks

Medical errors—often linked to incomplete information—are responsible for ~250,000 deaths annually in the U.S

80% of healthcare data is unstructured

Delayed or missed diagnoses affect approximately 12 million patients annually in the U.S

BlockHaven

A New Foundation for Health Intelligence Infrastructure

BlockHaven is a health intelligence platform that transforms how health data is owned, interpreted, and used over time. It creates a continuous, individual-centered health memory, enabling real-time insights, longitudinal understanding, and privacy-preserving intelligence—turning fragmented data into a cohesive, lifelong health narrative.

Key Features of BlockHaven

HealthMemory
A continuously evolving, lifelong health memory that captures data across time and contexts

Sovereign Health Vault
End-to-end encrypted, user-owned data storage with zero institutional custody

Haven AI Assistant
Context-aware intelligence that provides personalized, explainable insights grounded in individual health data

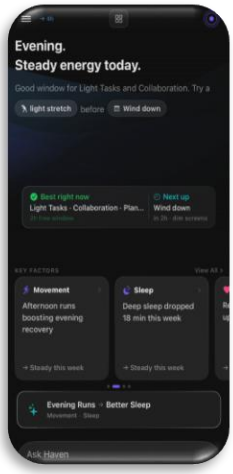
Continuous Health Intelligence
Real-time understanding of health patterns rather than episodic snapshots

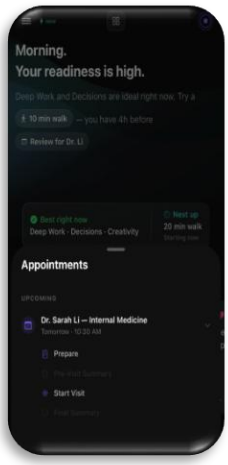
Consent-Based Data Sharing
Individuals control what data is shared, with whom, and for how long

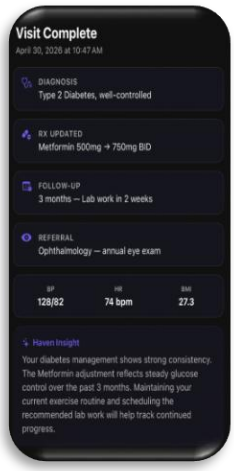
Integrated Health Data Layer
Unifies inputs from wearables, providers, and documents into a single system

Clinical Context Engine
Enables providers to access deeper patient context for improved decision-making

Longitudinal Health Timeline
Tracks health progression, interventions, and outcomes across a lifetime







BlockHaven

A New Foundation for Health Intelligence Infrastructure

BlockHaven is built as a **multi-layered intelligence infrastructure**:

- **Identity Layer**
  Individual-owned, device-native identity as the root of the system
- **Memory Layer (HealthMemory™)**
  Persistent, evolving representation of health data
- **Intelligence Layer (Haven AI)**
  Transforms data into contextual, explainable insights
- **Integration Layer**
  Connects fragmented systems (EHRs, wearables, diagnostics)
- **Network Layer**
  Enables consent-based aggregation for population-level insights

Key Differentiators

Individual-Anchored System

- Shifts control from institutions to individuals, making the person—not the provider—the center of the health system.

Memory-Driven Intelligence

- Replaces episodic records with continuous, compounding health memory.

Privacy as Architecture

- Data is encrypted, user-controlled, and never centrally accessible—ensuring true sovereignty.

Explainable AI

- Insights are transparent, traceable, and grounded in individual data—not generic models.

Non-Institutional Design

- Built to persist beyond any single provider, platform, or healthcare system.

Impact Potential

For Individuals

- Full ownership and control of health data
- Improved health awareness and decision-making
- Seamless continuity across life stages and providers

For Healthcare Providers

- Access to richer patient context
- Reduced diagnostic uncertainty
- Improved care coordination and efficiency

For Health Systems and Payers

- Reduced redundancies and costs
- Better population health insights
- Enhanced value-based care delivery

For Research and Public Health

- Ethical, consent-driven access to longitudinal data
- Improved quality of real-world evidence
- Scalable insights without centralized data extraction

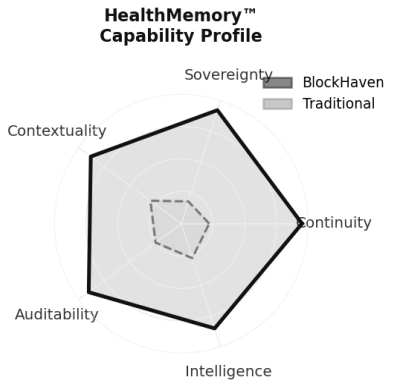
BlockHaven

A New Foundation for Health Intelligence Infrastructure

Broader System Transformation

BlockHaven represents a fundamental shift in how health data is structured, owned, and used:

Traditional Healthcare Model	BlockHaven Model
Institution-centric	Individual-centric
Fragmented records	Continuous memory
Reactive care	Proactive intelligence
Data silos	Unified health layer
Opaque AI	Explainable intelligence



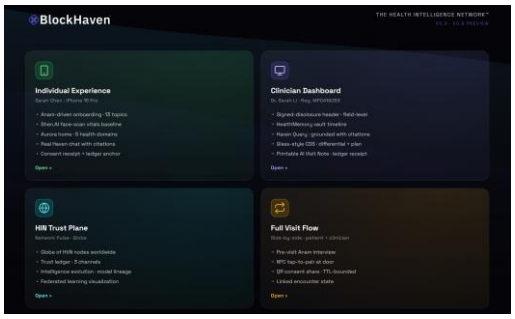
HealthMemory™ capability profile

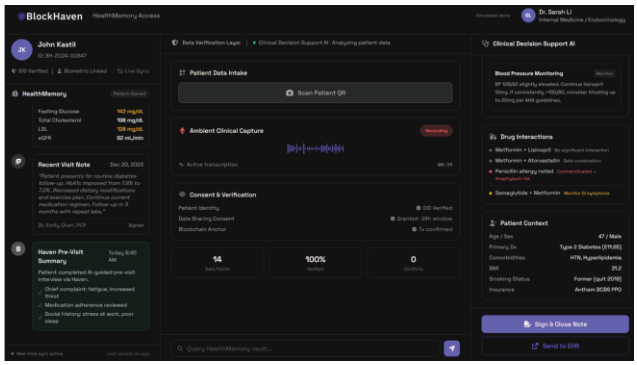
BlockHaven is not digitizing healthcare—it is redefining its foundation.

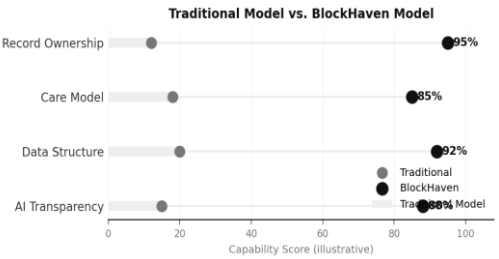
By anchoring intelligence in continuous, sovereign memory, BlockHaven transforms healthcare into a system that is:

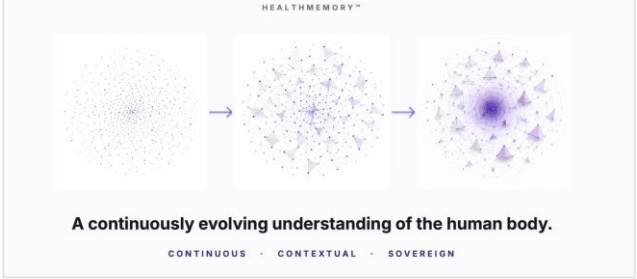
- Persistent — memory that does not reset at institutional boundaries
- Contextual — insight delivered at the moment and place it matters most
- Ethical by design — privacy and consent enforced structurally, not procedurally

and ultimately capable of delivering better decisions, better outcomes, and lifelong health intelligence.









Capability comparison: Traditional model vs. BlockHaven

BlockHaven

A New Foundation for Health Intelligence Infrastructure

HealthMemory™: The Foundation of Continuous Intelligence

HealthMemory™ is a core innovation behind BlockHaven—a **living, evolving representation of an individual's health over time.**

Key Characteristics:

- **Continuous** → Tracks health across a lifetime, not just discrete encounters
- **Contextual** → Provides insights at the point of care, grounded in sequenced history
- **Sovereign** → Owned and controlled by the individual, with structural consent enforcement

Unlike static electronic health records, HealthMemory™ enables **compounding intelligence**, where each data point contributes to a richer, more accurate understanding over time.

Research Foundations and Conceptual Framework

BlockHaven is grounded in a strong intellectual framework synthesizing adjacent research domains:

- **The Memory Thesis** → Intelligence requires continuity; episodic systems cannot accumulate understanding
- **Canonical Health State** → A unified, append-only representation of health over time anchored to the individual
- **Compounding Intelligence** → Layered, longitudinal data enables scalable clinical and population-level insight

These principles form the foundation of a system designed for **long-term evolution and resilience**

Key Capabilities

1 HealthMemory™ Substrate A persistent, append-only health record anchored to the individual. Every assertion is immutable, time-stamped, and provenance-tracked — never overwritten.	**2 Ambient Clinical Capture** Live visit recording that captures clinical context in real time, reducing documentation burden while preserving a richer, sequenced clinical record.
3 AI-Driven Decision Support Intelligence derived from longitudinal health context — not snapshots. Outputs remain downstream of canonical state and cannot rewrite the substrate.	**4 Consent-Based Architecture** Every data sharing delegation is scoped, time-bound, and contextual. Revocation is structural. Authority always remains with the individual.
5 Individual & Clinician Experience Dual-sided platform: individuals manage their health memory; clinicians gain contextual depth they have never had — without institutional extraction.	**6 Population Intelligence Layer** Collective insight emerges from consented sovereign contribution. No central repository. No extraction. Intelligence scales without compromising privacy.

BlockHaven

A New Foundation for Health Intelligence Infrastructure

HealthMemory™ is not an electronic health record, patient portal, or static health profile. It is a persistent, individual-centered memory layer — a continuously accumulating substrate that preserves the biological and clinical history of a person over time, anchored to that individual rather than to any institution, provider, or system

HealthMemory™ IS

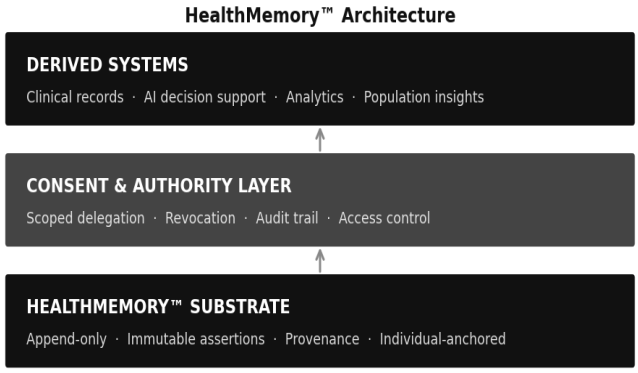
- A persistent, append-only health substrate
- Individual-anchored and sovereignty-preserving
- Contextual, sequenced, and provenance-tracked
- Continuous across providers and time
- The root layer from which all clinical views

HealthMemory™ is NOT

- An electronic health record (EHR)
- A patient portal or consumer health app
- A static snapshot or health summary
- An institution-owned data repository
- A compliance or billing artifact

Architecture & Trust Model

HealthMemory™ is built on a small set of structural primitives enforced at the substrate level — not as policy, but as architecture. The system assumes adversarial conditions by default and is designed to survive optimization pressure, incentive misalignment, and institutional rewrite.



Structural Invariants

- Canonical state is append-only
- Assertions are immutable once recorded
- Authority is explicit and individually anchored
- Provenance is mandatory for every assertion
- Derived systems cannot mutate canonical state
- Consent is structurally bound, not procedural

Consent & Authority Model

Every delegation is defined along three axes:

- Scope — class of assertions permitted
- Duration — temporal interval of validity
- Context — conditions under which it applies

- Revocation terminates future authority; it cannot erase historical assertions. Audit is structural, not procedural.

HealthMemory™ is BlockHaven's core architectural primitive — a persistent, append-only substrate that accumulates an individual's health state over time without ever overwriting what came before. Rather than storing snapshots owned by institutions, it records immutable assertions: discrete, timestamped statements about health-relevant state, each carrying who made the claim, under what authority, and from what source. Institutions, clinicians, and devices contribute to it as delegated actors under scoped, revocable consent — but the record itself belongs to the individual and travels with them across every provider, setting, and transition. Clinical summaries, AI outputs, and diagnostic interpretations are derived projections of this substrate; they can consume it, but they cannot alter it. The result is a health memory that is continuous across a lifetime, contextual in that it preserves sequence and provenance rather than isolated values, and sovereign in that the individual remains the permanent root of authority — something no electronic health record, patient portal, or interoperability standard has ever structurally guaranteed

BlockHaven: Core Team

Justin Kastil
Founder & CEO, Systems Engineer

Architect and primary builder of HealthMemory across the system core, the application and experience layer, the sovereign compute deployment, and the foundational IP.

Andrew Tsai
Chief Operating Officer

Owns BlockHaven's operational intelligence: the systems and discipline that scale a senior, lean team to infrastructure-class output

Paul Sonnier
Chief Growth & Partnerships Officer

Founded the Digital Health LinkedIn group (2009; 117,000+ members) and originated industry use of the term digital health. Author of The Fourth Wave: Digital Health. HITLAB Fellow. Leads BlockHaven's growth and institutional partnerships, including the Founding 25 Partners Consortium of The Health Intelligence Network.

Eleanna Panagiotou
Machine Learning Engineer

Builds the machine learning layer: on-device retrieval and reasoning, and the federated learning capability that comes online with The Health Intelligence Network.

Mike Orgayle
Core Systems Engineer

Builds the system foundation that makes individual-owned continuous health memory practical.

Eric Powell
Core Systems Engineer

Builds the cloud and infrastructure backbone that lets The Health Intelligence Network operate at network scale.

David Wick
Board Director.

Among BlockHaven's earliest investors. Provides board-level strategic counsel on commercial and operational direction.

The remaining members of the core twelve contribute across finance, product, growth, and operations. The team is supported by seven advisors crossing clinical, health policy, engineering, and strategic domains.

HITLAB Heuristic Evaluation

Assessing Usability, Continuity, and Intelligence in BlockHaven

HITLAB conducted a comprehensive heuristic evaluation of the BlockHaven platform to assess its usability, functionality, and overall user experience across both mobile and web interfaces. The evaluation focused on how effectively the platform enables individuals and clinicians to interact with a continuous, longitudinal health intelligence system.

This assessment was grounded in the reality that modern healthcare operates within fragmented systems, where both patients and clinicians must make critical decisions with incomplete and disconnected information. As highlighted in the research:

"Clinicians and care teams are required to make consequential decisions every day with fragmented, incomplete, and temporally disconnected information."

The evaluation examined how BlockHaven addresses this structural gap by introducing HealthMemory™, a persistent, individual-anchored health record designed to enable continuity, context, and intelligence over time.

The study was conducted over a multi-day period, with researchers interacting with the platform across:

- Mobile (individual-facing experience)
- Desktop (dashboard and system-level interaction)

The goal was to identify strengths, usability gaps, and opportunities for refinement as the platform evolves toward launch.

Methodology

The evaluation followed Jakob Nielsen's 10 Usability Heuristics (1994)—a globally recognized framework for assessing digital interfaces. These principles provided a structured lens to evaluate how well BlockHaven aligns with established usability standards.

Evaluation Approach

Researchers systematically assessed the platform across:

- **Design & Layout** → Clarity, hierarchy, and visual simplicity
- **Navigation & Flow** → Ease of movement across features
- **Functionality** → Effectiveness of core workflows
- **Content & Communication** → Clarity, relevance, and accessibility

Evaluation Methodology Steps

- **STEP 01: Framework Selection**
  Application of Jakob Nielsen's 10 Usability Heuristics as the core evaluation framework

- **STEP 02: Persona Development**
  Patient & Clinician Personas:
  Patients seek continuity, ownership, and reduced burden in managing fragmented health data, while clinicians need complete, contextual information to make accurate decisions.
  Both highlight a shared need for a unified, longitudinal health system that eliminates fragmentation and enables informed, efficient care.

- **STEP 03: Multi-Day Expert**
  Two expert researchers conducted structured walkthroughs across mobile and desktop environments

- **STEP 04: Section-by-Section Analysis**
  Detailed evaluation across: Onboarding, Health vault, AI assistant, Data connections, Clinical workflows, Sharing and communication

- **STEP 05: Recommendations & Impact**
  Issues categorized by severity and mapped to actionable design and system improvements

HITLAB Heuristic Evaluation

Assessing Usability, Continuity, and Intelligence in BlockHaven

Individual/Patient Persona

Personas provide insights into human experience, pain points, motivations, and realities. They are a research-based empathy tool to understand the needs and barriers of a population. For the BlockHaven platform, we developed the persona of a 43-year-old Type 2 diabetic and an autoimmune thyroid condition, facing the Marketing Director at Corporate Company in Chicago, IL.

Persona: 43-year-old Marketing Director-

Sarah Reynolds

Occupation: Marketing Director
Age: 43

> *I've had the same health issues for years, but every new doctor treats me like I just walked off the street. I'm exhausted from being my own medical historian.*

Background

Sarah is a marketing director managing Type 2 diabetes and an autoimmune thyroid condition across four separate providers, none of whom share a common electronic record system. Despite being an active, motivated patient, she spends a disproportionate amount of her time and energy managing the administrative burden of her own care rather than focusing on her health.

Goals

- Sovereign, lifelong health record that is independent of any provider or system and compounds in value over time.
- She wants her care team to have the longitudinal context needed to make better, more consistent decisions, and she wants to reclaim the time and cognitive energy currently consumed by health administration.

Challenges

- Practical fragmentation of her care , four portals, no interoperability, and no single clinician with visibility across both her conditions simultaneously.
- Medication reconciliation is a persistent risk with multiple prescribers involved.

Motivations

- Desire to manage her conditions proactively and prevent long-term deterioration.
- To be an informed participant, not a passive recipient of fragmented decisions.
- Contributing data to meaningful research with consent.

Frustrations

- Being treated as a new patient at every encounter despite years of documented history and adds mental strain.
- Worn down by repeating the same medications, conditions, and allergies.
- Her data serves institutions, not her.

Needs

- A single, unified health record that travels with her across all providers and settings.
- She needs her data to be private, encrypted, and genuinely hers, not owned by an institution, and she needs health intelligence that evolves with her over time, not just isolated snapshots.

HITLAB Heuristic Evaluation

Assessing Usability, Continuity, and Intelligence in BlockHaven

PHYSICIAN PERSONA

Personas provide insights into human experience, pain points, motivations, and realities. They are a research-based empathy tool to understand the needs and barriers of a population. For the BlockHaven platform, we developed the persona of a 38-year-old Internal Medicine Physician at a large academic medical center in Boston.

Persona: 38-year-old Internal Medicine Physician

Dr. Marcus Webb

Occupation: Internal Medicine Physician
Age: 38

> I'm making critical decisions based on whatever the patient remembers or whatever made it into the last discharge summary. There is so much I never get to see, and that gap is where harm lives.

Background

Dr. Webb has over twelve years of experience managing complex, multi-morbid patients. He is clinically skilled and deeply committed to quality care, yet routinely constrained by fragmented, incomplete information at the point of decision. He feels burned out but not disengaged, to exercise judgment which are instead consumed by information gaps and administrative overhead.

Goals

- Unified patient history available on demand, without chasing records across systems.
- Transparent AI support that accelerates decisions without displacing clinical authority.
- Fewer hours lost to documentation, recovered for direct patient care.

Challenges

- Non-interoperable EHR systems forcing manual history reconstruction every shift.
- Cognitive overload where incomplete data, time pressure, and complexity compound simultaneously.
- Adopting new tools that demand workflow disruption without a clear, immediate return.

Motivations

- Belief that better infrastructure, not harder work, is the path to fewer errors.
- Conviction that most diagnostic failures are system failures, not clinician failures.
- Reclaiming the clinical reasoning and patient relationships that drew him to medicine.

Frustrations

- Making high-stakes decisions on partial histories and unreliable patient recall.
- Ordering duplicate investigations because prior results are inaccessible, not absent.
- EHR systems that add cognitive load rather than supporting clinical thinking.

Needs

- Complete, longitudinal patient history accessible at the point of care, across all prior settings.
- Contextual intelligence that surfaces trends and care gaps without manual retrieval.
- Streamlined documentation that returns time to direct patient care.

HITLAB Heuristic Evaluation

Assessing Usability, Continuity, and Intelligence in BlockHaven

Findings

The heuristic evaluation of BlockHaven indicates a **strong alignment with core usability principles**, supported by a well-structured design, intuitive navigation, and a cohesive interaction model.
Overall, the platform demonstrates **high potential as a next-generation health intelligence system**, with particular strengths in:

- Clear workflow progression across patient journeys
- Thoughtful integration of AI-supported guidance
- Strong emphasis on privacy, continuity, and user control

While the platform is currently in its pre-launch phase, the evaluation reflects a system that is already functionally robust and conceptually mature, with ongoing refinements expected to further enhance usability and scalability.

As BlockHaven moves toward full launch, the findings of this evaluation provide a clear and actionable roadmap for continued improvement. Addressing the identified usability opportunities — particularly around onboarding clarity, clinician workflow efficiency, and accessibility — will be critical in ensuring the platform meets the expectations of both individual users and clinical professionals. With its strong foundational architecture and user-centered design philosophy, BlockHaven is well-positioned to redefine how health data is captured, preserved, and leveraged across the continuum of care.

Heuristic Ratings

Heuristic Criterion	Rating
Visibility of system status	■■■■□
Match between system and the real world	■■■■□
Recognition rather than recall	■■■■□
Flexibility & Efficiency	■■■■□
Aesthetic & Minimalist Design	■■■□□
Error Recognition & Recovery	■■■■□
Flexibility and efficiency of use	■■■■□

The BlockHaven platform demonstrated consistent performance across HITLAB's heuristic dimensions, with most ratings in the 3-4 range, reflecting a strong, well-structured, and user-centered design. No critical issues were identified, and all recommended improvements are focused on usability refinement and feature enhancement rather than foundational redesign.

Post-Recommendations Enhancements

Current Implementation and System Improvements

Following the heuristic evaluation, BlockHaven implemented a series of targeted enhancements to strengthen usability, trust visibility, workflow clarity, and system robustness. These improvements were not architectural changes, but experience-layer refinements that make the underlying system more intuitive, transparent, and scalable.

1. Identity, Onboarding & Access Enhancement

Current Implementation

- Device-native identity creation (no email/password dependency)
- Biometric authentication (Face ID / Touch ID)
- Passkey-based authentication across devices
- 2-of-3 recovery system (recovery phrase + device + cloud backup)

Enhancements Made

- Introduced guided conversational onboarding via Haven AI
- Improved step-by-step setup clarity with visual feedback
- Added backup verification indicators during onboarding
- Simplified recovery instructions with safety prompts

Outcome: A smoother onboarding experience that reinforces ownership, security, and confidence from the first interaction.

2. Privacy, Consent & Trust Visibility

Current Implementation

- Zero-custody architecture (no server-side readable data)
- End-to-end encryption with on-device key management
- Consent-based data sharing with revocation controls

Enhancements Made

- Introduced plain-language privacy explanations
- Added granular consent controls (sharing, research, provider access)
- Implemented real-time visibility indicators:
  - Encryption status
  - Backup status
  - Sharing activity
- Strengthened tamper-proof audit logs with user access

Outcome: Privacy is no longer abstract—it is observable, understandable, and verifiable by the user.

Passkey-based, biometric authentication with guided conversational onboarding

No passwords

No friction

Full ownership from the first interaction

Zero-custody

End-to-end encrypted with real-time visibility into encryption

Backup, and sharing status

Experience-layer refinements that make the underlying system more intuitive, transparent, and trustworthy

Post-Recommendations Enhancements

3. Health Vault Usability & Data Transparency

Current Implementation	Enhancements Made

• Fully encrypted personal health vault
• Categorized health records (labs, medications, conditions, etc.)
• Cloud backup with encrypted sync
	• Introduced visual vault browser with expandable record views
	• Added:
	  ○ Filter and search capabilities
	  ○ Summary statistics (records, types, storage)
	  ○ Color-coded categorization for quick navigation
	• Improved auto-lock and session security feedback
	Outcome: Users gain full visibility into their data—transforming the vault into an auditable, user-controlled system.

4. Haven AI Assistant – Transparency & Intelligence

Current Implementation	Enhancements Made
Natural language query interface AI grounded in user-specific health data Multi-model AI orchestration (on-device + cloud escalation)	Introduced AI reasoning trace (“thinking timeline”) Added: Confidence indicators Evidence citations Model-level transparency Strengthened PII redaction before cloud escalation Improved response clarity and structured outputs Outcome: AI shifts from a black box to a transparent, explainable decision-support system.

5. Clinical Workflow & Doctor Visit Experience

Current Implementation	Enhancements Made
• Pre-visit preparation tools • Audio capture of doctor visits • Structured clinical summaries	• Defined a clear end-to-end visit workflow: • Prepare → Record → Process → Review → Share • Introduced: • Real-time recording indicators • Structured categorization of visit outputs • Editable summaries and action items • Added status visibility (lock screen / dynamic indicators) • Outcome: Clinical interactions are transformed into structured, reusable, and longitudinal intelligence.

Memory endures

Nothing escapes

AI exposed

Trust built

Yours forever

Visits immortalized

Clarity wins

Records follow

Intelligence compounds

Privacy seen

Data liberated

Context preserved

Answers grounded

Care continuous

History intact

Post-Recommendations Enhancements

Current Implementation and System Improvements

6. Data Integration & Context Awareness

Current Implementation	Enhancements Made
• Document ingestion (PDF, images → structured data) • Calendar-based appointment detection	• Improved background syncing and data freshness indicators • Added clear permission prompts for data sources • Enhanced context-aware prompts (e.g., pre-visit reminders) • Outcome: Data flows more seamlessly, enabling real-time, context-aware health intelligence.

7. Security, Auditability & System Feedback

Current Implementation	Enhancements Made

• Immutable audit logs
• Encrypted backups
• Session-based sharing with revocation
	• Added user-facing audit trail visibility
	• Added user-facing audit trail visibility
	• Introduced:
	  ○ Action confirmations for sensitive operations
	  ○ Session status indicators during sharing
	• Strengthened error handling and recovery guidance
	Outcome: System behavior becomes predictable, traceable, and trustworthy

8. Reduction of Cognitive Load & UX Simplification

Enhancements Made Across the Platform
Simplified navigation structure
Introduced progressive disclosure of information
Added guided actions and contextual prompts
Reduced reliance on technical terminology
Outcome: Improved accessibility for both non-technical users and clinical contexts.

Overall Enhancement Impact

The post-recommendation updates resulted in:

- Improved usability and onboarding clarity
- Greater transparency in privacy and AI behavior
- Stronger alignment between product experience and core philosophy
- Reduced user cognitive burden
- Enhanced trust through visible system feedback

Current State Summary

BlockHaven now reflects a system where:

- Core architecture is implemented and stable in the pre-launch builds
- Experience layer is refined and user-centric
- Remaining work focuses on:
  - Advanced intelligence (proactive insights)
  - Deterministic computation
  - Expanded interoperability

HITLAB Heuristic Evaluation

Strengths of the Platform

Sovereign Health Architecture

BlockHaven establishes true data ownership through a zero-custody architecture, where all health data is encrypted and controlled by the individual. This eliminates institutional dependency and ensures that users always retain full authority over their health information.

Real-Time, Continuous Health Memory

HealthMemory™ enables a longitudinal, continuously evolving record of an individual's health. Unlike episodic systems, BlockHaven preserves context across time, improving decision-making and reducing reliance on fragmented recall.

Native Privacy & Security Design

Privacy is embedded at the architectural level through on-device encryption, passkeys, biometric authentication, and tamper-proof audit logs. Security is not an add-on—it is foundational to the system.

Transparent & Explainable Intelligence

The Haven AI assistant introduces visible reasoning and decision transparency, allowing users to understand how insights are generated. Confidence indicators, evidence-backed responses, and reasoning traces build trust in AI-driven health guidance.

End-to-End Clinical Workflow Capture

BlockHaven captures the entire doctor visit lifecycle—from preparation to structured summaries—ensuring no information is lost. This transforms clinical interactions into organized, actionable intelligence that persists beyond the visit.

Granular User-Controlled Data Sharing

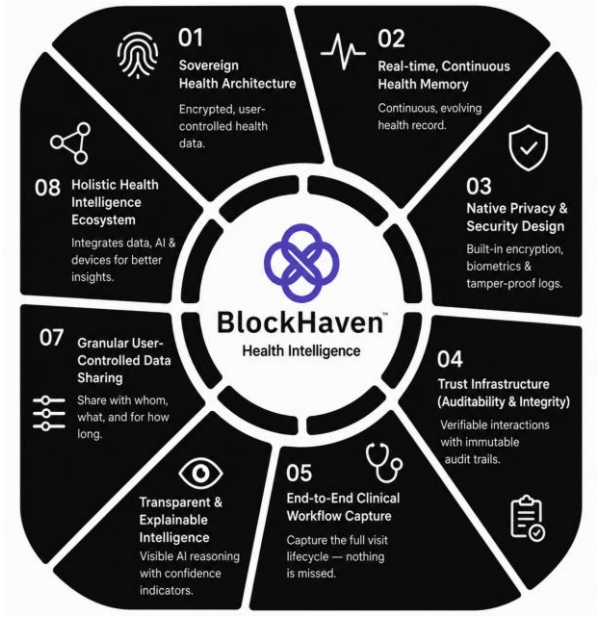
Users can define what data to share, with whom, and for how long, with session-based access and revocation. This shifts control from institutions to individuals, enabling consent-driven data exchange.

Holistic Health Intelligence Ecosystem

By integrating wearables, clinical records, documents, and AI, BlockHaven creates a unified, multimodal health intelligence system. This holistic approach enables deeper insights and supports both individual care and population-level understanding.

Trust Infrastructure (Auditability & Integrity)

BlockHaven integrates immutable audit trails and cryptographic attestations, ensuring that all interactions are verifiable and tamper-proof. This builds a new layer of system-wide accountability.



The heuristic evaluation represents the first phase of a structured validation program, usability (task completion, NASA-TLX workload), trust and consent comprehension, perceived cognitive burden for both individuals and clinicians, and care-team utility through scenario-based evaluation

Conclusion

The evolving healthcare landscape highlights the urgent need to move beyond fragmented, episodic records toward systems that enable continuous, context-rich understanding. As care becomes more distributed and complex, decisions made without full patient context increase risks for both individuals and clinicians, underscoring the need for reliable, longitudinal health intelligence. BlockHaven addresses this gap through HealthMemory™ and *The Health Intelligence Network*™, creating a foundation for individual-owned, continuously evolving health data. By combining data sovereignty, privacy-first architecture, and explainable AI, it enables more informed decision-making while restoring control to individuals.

By enforcing individual-level data sovereignty through cryptographic access controls and consent-bound delegation, BlockHaven eliminates the trust-authority mismatch inherent in centralized repositories, enabling a privacy-preserving intelligence layer in which longitudinal signal compounds across a lifetime — transforming health data from a static administrative artifact into a dynamic, clinically actionable substrate for continuous, evidence-informed care.

HITLAB's evaluation validates BlockHaven as a purpose-built, forward-looking platform, with strong capabilities in privacy, transparency, and workflow integration. By shifting from data storage to compounding intelligence, BlockHaven offers a scalable, ethical model for the future of healthcare.

Overall, BlockHaven represents a forward-looking shift in healthcare—one that places the individual at the center of intelligence, enables continuous understanding across time, and builds a system where trust, privacy, and insight coexist to improve outcomes at every level of care.

BlockHaven's HealthMemory™ addresses the unmet gaps at the substrate level by implementing an append-only, assertion-based canonical health state, an immutable, time-consistent record anchored to the individual rather than the institution. Each discrete health event is encoded as a provenance-bound assertion preserving both occurrence time and assertion time, ensuring that causal sequences remain intact and retrospective corrections never corrupt the integrity of the historical record. As a transformative and thoughtfully designed health intelligence platform, BlockHaven has the potential to become a foundational layer in digital health, empowering individuals, enhancing clinical outcomes, and enabling a more connected, responsive, and intelligent healthcare system.

> BlockHaven exemplifies how healthcare can move beyond fragmented records toward a continuous, individual-centered intelligence system. By combining privacy-preserving architecture with longitudinal health memory and explainable AI, it demonstrates the potential to redefine how health is understood, managed, and improved over time—without compromising trust or ownership.
>
> — Stan Kachnowski, Chair, HITLAB

HITLAB

BlockHaven™

HITLAB is a leading healthcare innovation lab dedicated to improving health outcomes worldwide. Through rigorous research, education, and collaboration, HITLAB identifies and supports the development of transformative health technologies.

Contact us for further inquiries

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