**CARE360° AS A SYMBOLIC-INFORMATIONAL ECOSYSTEM: CURATING ETHICAL, INCLUSIVE, AND AI-DRIVEN NEURODIVERGENT CARE IN THE DIGITAL HEALTH ERA**

CARE360° COMO ECOSSISTEMA SIMBÓLICO-INFORMACIONAL: CURADORIA ÉTICA, INCLUSIVA E BASEADA EM IA PARA O CUIDADO DE PESSOAS NEURODIVERGENTES NA ERA DA SAÚDE DIGITAL

**Resumo**

O projeto Care360° propõe uma transformação na forma como cuidamos da saúde mental de pessoas neurodivergentes no Brasil. A plataforma digital, desenvolvida como um Software como Serviço (SaaS) baseado em inteligência artificial generativa, combina automação clínica, curadoria simbólica da informação e design centrado no usuário. Partindo do princípio de que o cuidado em saúde é essencialmente um processo informacional, Care360° atua como ferramenta de apoio clínico e infraestrutura ética para organização de dados sensíveis, respeitando a autonomia e o contexto dos indivíduos. A metodologia envolve coleta empírica de dados, oficinas participativas e aprendizado de máquina, estruturada em quatro etapas cronológicas: mapeamento clínico, treinamento de modelos, calibração semiótica e testes de interoperabilidade com governança baseada em blockchain. A Fase 1 do projeto será realizada em cinco clínicas piloto no Brasil, com a participação de aproximadamente 30 profissionais, cuidadores e usuários da plataforma, em entrevistas e testes de usabilidade. Espera-se alcançar uma redução de 30% no tempo entre diagnóstico e intervenção, aumento de 25% na adesão terapêutica e adoção da ferramenta por pelo menos 10 mil usuários em dois anos. Care360° representa um novo paradigma de cuidado digital, ao unir inteligência coletiva, ética da informação e neurodiversidade como base para soluções tecnológicas mais humanas, inclusivas e eficazes.

**Palavras-chave:** Neurodiversidade; Ciência da Informação; IA Ética; TEA; Saúde digital

**Abstract**

Care360° introduces a transformative model for mental health support among neurodivergent populations in Brazil. Developed as a Software-as-a-Service (SaaS) platform powered by generative artificial intelligence, Care360° merges clinical automation, symbolic information curation, and user-centred design into an ethically governed ecosystem. Based on the premise that healthcare is fundamentally an informational process, the platform serves both as a clinical decision-support tool and a semantic infrastructure that preserves context, autonomy, and narrative integrity. The methodology combined empirical data collection, participatory co-design, and machine learning, structured across four chronological phases: clinical mapping, model training, semiotic calibration, and interoperability testing with blockchain-based governance. Phase 1 of the project will be carried out in five pilot clinics across Brazil and involve approximately 30 participants, including health professionals, caregivers, and users, through interviews and usability testing. Expected outcomes include a 30% reduction in the diagnosis-to-intervention interval, a 25% increase in therapy adherence, and at least 10,000 active users within 24 months. Care360° embodies a paradigm shift toward an integrative, ethically informed digital mental health model. By treating data not just as raw input but as meaningful narrative, the platform elevates Information Science as a key enabler of inclusive, person-centred digital care.

**Keywords:** Neurodiversity; Information Science; Ethical AI; ASD; Digital Health

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# **Abstract:** Care360° introduces a transformative model for mental health support among neurodivergent populations in Brazil. Developed as a Software-as-a-Service (SaaS) platform powered by generative artificial intelligence, Care360° merges clinical automation, symbolic information curation, and user-centred design into an ethically governed ecosystem. Based on the premise that healthcare is fundamentally an informational process, the platform serves both as a clinical decision-support tool and a semantic infrastructure that preserves context, autonomy, and narrative integrity. The methodology combined empirical data collection, participatory co-design, and machine learning, structured across four chronological phases: clinical mapping, model training, semiotic calibration, and interoperability testing with blockchain-based governance. Phase 1 of the project will be carried out in five pilot clinics across Brazil and involve approximately 30 participants, including health professionals, caregivers, and users, through interviews and usability testing. Expected outcomes include a 30% reduction in the diagnosis-to-intervention interval, a 25% increase in therapy adherence, and at least 10,000 active users within 24 months. Care360° embodies a paradigm shift toward an integrative, ethically informed digital mental-health model. By treating data not just as raw input but as meaningful narrative, the platform elevates Information Science as a key enabler of inclusive, person-centred digital care.

**Keywords:** Neurodiversity; Information Science; Ethical AI; ASD; Digital Health

# **1 Introduction**

Brazilian families affected by neurodivergence confront persistent informational and logistical barriers to diagnosis, intervention, and follow-up (World Health Organization [WHO], 2022). Although digital-health innovations abound globally, few systems are culturally adapted, ethically governed, and information-centred. Building on the premise that health care is fundamentally an informational process (Floridi, 2011), Care360° was designed to remedy these deficits by acting simultaneously as a clinical support tool and as a curator of symbolic meaning for neurodivergent populations.

In line with Capurro’s (2000) call for informational dignity, the project treats the management of sensitive data as an ethical practice that must preserve context, autonomy, and narrative integrity. Moreover, adopting Singer’s (2016) neurodiversity framework reframes ASD from a deficit model to an epistemological lens—one that foregrounds inclusive knowledge representation and challenges conventional classificatory regimes (Hacking, 2002). Care360° thus responds to informational exclusion by offering a sociotechnical environment in which data flow, knowledge organisation, and clinical sense-making are co-designed with neurodivergent stakeholders.

# **2 Methodology: A symbolic informational framework**

The development of Care360° follows an **iterative, mixed-methods approach**, grounded in **information ethics and symbolic infrastructure theory** (Drucker, 2020). The methodology combines empirical data collection, participatory design, and applied machine learning, situated within a sociotechnical context. All activities will be conducted during Phase 1 of the FAPESP PIPE program, involving five pilot clinics across Brazil.

**2.1 Research context and participants**

The empirical phase involves **healthcare settings** with diverse sociodemographic profiles (urban and rural, public and private). Participants included are **clinicians** (psychologists, psychiatrists, speech therapists, and occupational therapists), **caregivers**, and **platform users**. A total of **30 individuals** participated in interviews, usability tests, and co-design workshops between March and June 2025.

**2.2 Chronological stages of development**

**Stage 1 – Clinical Mapping and Knowledge Organization:**
Clinical workflows and taxonomies will be mapped for each specialty using field interviews and documentary analysis. The resulting structure informs the symbolic modules of the platform.

**Stage 2 – Dataset Aggregation and Training:**
Data will be collected from EHRs (e.g., e-SUS), caregiver reports, and wearable sensors. These multimodal inputs trained ML models to detect speech, behavior, and therapy adherence patterns. All models will be validated using 10-fold cross-validation.

**Stage 3 – Semiotic Calibration and Interface Prototyping:**
Outputs from AI models will be subjected to **human-in-the-loop interpretation** by clinical experts, ensuring contextual and semantic alignment. Early prototypes of dashboards and transcriptions will be tested with professionals using think-aloud protocols and the SUS (System Usability Scale).

**Stage 4 – Interoperability Testing and Governance Layer:**
HL7/FHIR APIs will be integrated into three clinical systems (municipal, university, and private). Simultaneously, blockchain infrastructure (Hyperledger Fabric) will be deployed to handle **granular consent management**, respecting LGPD, GDPR, and HIPAA guidelines.

## **2.3 Informational architecture and symbolic modules**

Each clinical module, psychology, psychiatry, speech therapy, and occupational therapy, functions as a semantic unit of symbolic care, integrating AI-driven diagnostics, therapy planning, and monitoring dashboards. Module taxonomies adopt principles of knowledge organisation (Hjørland, 2008), thereby ensuring that data entities reflect social practice rather than purely biomedical hierarchies.

## **2.4 Usability, inclusion, and curatorial feedback loops**

## User-centred design sessions engage clinicians, neurodivergent persons, and caregivers. Usability metrics extend beyond efficiency to examine whether users *feel recognised* by the interface, aligning with Drucker’s (2020) assertion that usability is also an affective and symbolic construct.

## **2.5 Governance, trust, and informational consent**

To operationalise trust, Care360° integrates LGPD, GDPR, and HIPAA requirements with a blockchain ledger that records granular consent events. This architecture realises Capurro’s (2000) principle that informational ethics must secure both privacy and contextual integrity.

**2.6 Limitations**

This methodology faces limitations: **Sample size** is limited to early adopters, potentially biasing feedback toward more tech-savvy professionals; **Wearable integration** is still in its preliminary phase, with real-time alerting yet to be tested in field conditions; **Cultural sensitivity** in symbolic translation remains an ongoing effort, requiring regional adaptation of taxonomies and interface language.

# **3 Expected results**

By the end of Phase 1 of PIPE on FAPESP, the functional prototype should demonstrate: **Diagnostic acceleration**: A 30 % decrease in the diagnostic-to-intervention lag via automated triage and scheduling. **Therapy adherence**: A 25 % increase in adherence through AI-generated, personalised engagement prompts. **Scalable adoption**: At least 10 000 active users (patients, caregivers, professionals) within 24 months. **Semantic automation**: ≥ 95 % accuracy in transcription, behavioural annotation, and progress tracking, metrics interpreted not as ends in themselves, but as semantic anchors that aid human decision-making. These outputs constitute both technical deliverables and *symbolic milestones* in constructing a trustworthy curatorial infrastructure for neurodivergent data (Paletta & Gonçalves, 2016).

# **4 Discussion**

Care360° exemplifies Lévy’s (1994) notion of *collective intelligence*, wherein human and algorithmic agents collaborate within a shared knowledge space. The platform operationalises Sætra, Coeckelbergh & Danaher (2021) concept of *ethical AI ecosystems* by embedding values such as transparency, autonomy, and inclusivity into its codebase and governance policies from inception. In doing so, it reframes mental-health technology as an informational commons wherein diverse subjectivities are not merely recorded but respected and empowered.

# **5 Conclusion**

Care360° advances a paradigm shift from fragmented, technocentric health solutions to an integrative, symbolic-informational ecosystem. By curating data as meaningful narrative and not merely as inert resource, the platform foregrounds the role of Information Science in mediating ethical, inclusive, and effective mental-health care. Its success will demonstrate that the future of digital psychiatry lies in infrastructures that honour both the technical and the symbolic dimensions of neurodiversity.

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