

Triadic Frameworks for Mental Health: The Transformative Potential of Triadic Framework Technology (TFT) in Diagnosis, Treatment, and Systemic Reform

Introduction

The mental health landscape in the 21st century is at a crossroads. While advances in neuroscience, psychology, and digital therapeutics have broadened our theoretical and technological reach, persistent challenges in diagnosis, treatment planning, pharmaceutical development, and trust between clinicians and patients thwart our capacity to deliver truly effective, personalized care. Traditional models-rooted in dyadic interactions between patient and clinician or simplistic input-output paradigms-cannot account for the complexity of human cognition, interpersonal relationships, and systemic factors influencing mental well-being. As clinical diagnostics rely heavily on subjectivity and trial-and-error medication, and as healthcare systems struggle with fragmentation and distrust, the need for a paradigm shift becomes inescapable.

Triadic Framework Technology (TFT) has emerged as a revolutionary approach drawing from the theoretical legacy of triadic models-such as Beck's Cognitive Triad, Family Systems Theory, Shared Decision-Making, Self-Compassion Pathways, and the Theory of Triadic Influence-and extending them into the digital, AI-enhanced realm. TFT proposes that complex, multivariable mental health phenomena are best modeled and influenced not by linear or binary frameworks, but by dynamic systems of three (or more) interacting elements. Through AI-assisted diagnostics, treatment planning tools, and pharmaceutical simulations, TFT can potentially transcend the limitations of traditional speculation-based practice, radically enhancing care precision and outcomes.

This paper systematically explores the historical and theoretical foundations of triadic frameworks, critiques current diagnostic and therapeutic processes, examines trust disconnects in clinical care, and charts the transformative role of AI-assisted triadic tools in mental health. It also details the emerging business case for TFT, particularly for pharmaceutical developers and insurance companies, while outlining practical reforms and opportunities for developers and ecosystem stakeholders.

Theoretical Foundations of Triadic Framework Technology (TFT)

The Legacy of Triadic Models in Mental Health

Aaron Beck's Cognitive Triad

Aaron Beck's work in the 1960s ushered in a seismic shift in clinical psychology and psychiatry by positing that depression and related mood disorders are underpinned by a **cognitive triad**: negative beliefs about the self, the world, and the future^{[2][3]}. Beck observed that patients

suffering from depression exhibited characteristic patterns—"automatic, spontaneous and seemingly uncontrollable negative thoughts"—that rotated around three axes:

- **Self:** "I'm worthless, incompetent, unlovable."
- **World:** "The world is unfair, dangerous, disappointing."
- **Future:** "Nothing will ever get better; all hope is lost."

The interaction of these beliefs creates a self-reinforcing cycle of despair and inaction. The cognitive triad was incorporated into cognitive behavioral therapy (CBT), which became one of the most empirically validated psychotherapeutic methods. Modern assessment tools—such as the Beck Depression Inventory (BDI) and Beck Hopelessness Scale—are structured around the triad, measuring negative cognition in all three domains.

Beck's model's power lies in its triadic logic: states of mind are rarely binary or purely internal or external; rather, they exist as emergent phenomena from the interaction of at least three domains. This insight not only permits more nuanced clinical assessment but sets the stage for frameworks that account for multi-level complexity in human psychology.

Family Systems Theory

Family Systems Theory, developed by Murray Bowen and colleagues in the 1950s and 1960s, introduced a second major triadic foundation for mental health intervention^{[5][6]}. This systems approach critiques the focus on isolated individuals; instead, it views families and close social groups as emotionally interconnected units. Surpassing linear cause-effect models, Family Systems Theory highlights **triangulation**, the process by which two family members in tension draw in a third to mediate or deflect conflict. Bowen observed that such triangles are the basic building blocks of emotional systems, with families exhibiting predictable patterns of differentiation, enmeshment, and emotional cutoff as anxiety rises.

This triadic understanding extends into therapy: interventions that target one node of the triad (e.g., improving boundaries between parent and child) inevitably shift the dynamics among all parties, creating systemic change. Family systems diagrams (genograms) and dynamic mapping continue to form the bedrock of clinical training.

The Theory of Triadic Influence (TTI)

Further broadening triadic approaches, the Theory of Triadic Influence (TTI)—developed by Flay, Snyder, and Petraitis—integrates streams of influence from intrapersonal (personal), interpersonal (social), and cultural-environmental domains^[8]. Each stream is subdivided into cognitive and affective sub-streams, generating a multidimensional grid of health behavior determinants. TTI posits that health-related behaviors are shaped not just by immediate cognitive factors but by distal and ultimate causes stretching across personal, social, and cultural landscapes. The theory was expressly designed to offer a comprehensive framework for health behavior change, serving as the foundation for health promotion programs, research on substance use, and mental health interventions.

Recent Developments in Triadic Models

Shared Decision-Making: The triadic logic has found renewed relevance in contemporary practice through Shared Decision-Making (SDM). Traditional mental health care often involved the patient and clinician in a dyad; SDM expands this to include a third node, frequently a caregiver or family member, in the consultation process^{[10][11]}. This approach is gaining ground as studies increasingly demonstrate that involving caregivers leads to better adherence, fewer relapses, and improved patient satisfaction.

Self-Compassion Pathways: The field of self-compassion research, particularly as synthesized by Neff and Sirois, conceptualizes psychological well-being around three synergistic dimensions: self-kindness vs. self-judgment, common humanity vs. isolation, and mindfulness vs. over-identification^{[13][14]}. These axes echo the triadic approach-sustained mental health is viewed as emerging from the harmonious interplay of these domains, rather than from a linear focus on symptom reduction.

Critique of the Current Diagnostic Process in Mental Health

Diagnostic Error: Prevalence, Causes, and Systemic Issues

The diagnostic process in mental health is notably fraught with speculation, ambiguity, and delay. Unlike somatic medicine, psychiatry and psychology lack objective biomarkers for most conditions; thus, diagnosis depends on clinical interviews, behavioral observations, and sometimes self-report or collateral data^{[16][17]}. This inherent subjectivity gives rise to several problems:

- **High Error Rates:** Studies reveal substantial rates of missed, delayed, or incorrect diagnoses, leading to poor outcomes. For instance, delayed diagnosis of bipolar disorder is linked to more frequent relapse and increased hospitalizations; in one study, patients consulted an average of five clinicians before receiving a correct diagnosis^[15].
- **Cognitive Biases:** Clinicians are susceptible to cognitive errors-arbitrary inference, selective abstraction, overgeneralization, etc.-that align closely with distortions identified in Beck's triad. Such biases are exacerbated under time pressure and high clinical demand, leading to systematic errors.
- **Diagnostic Disparities:** Social determinants (e.g., ethnicity, socioeconomic status) influence diagnosis accuracy. Evidence shows that Black men are more likely to be misdiagnosed with schizophrenia, even when expert review diagnoses mood disorders, suggesting entrenched bias in clinical cognition.
- **Over-Reliance on Trial-and-Error Medication:** Lacking precision, many clinicians resort to "pill roulette"-cycling patients through successive medications until a favorable (or less harmful) response is achieved. Large-scale evidence reveals this approach to be inefficient, often leading to unnecessary side effects and loss of patient trust.
- **Limited Integration and Siloed Care:** The absence of integrated, multi-variable data

synthesis means clinicians often fail to see the systemic context of a patient's mental health, leading to fragmented treatment plans.

Table: Key Shortcomings of Traditional Diagnostic and Treatment Planning Approaches

Domain	Traditional Approach	Key Shortcomings
Diagnosis	Clinical interview, self-report, vignettes	Subjective, cognitive biases, high error rates
Treatment Planning	Trial-and-error medication selection	Inefficiency, side effects, delayed remission
Drug Development	Single-drug, placebo-controlled trials	Costs, lack of multi-drug interaction modeling
Care Coordination	Dyadic, clinician-patient focus	Missed systemic factors, limited shared planning

While incremental improvements-checklists, structured interviews, consensus panels-have helped, they remain reactive rather than predictive. There is an urgent need for more systemic, dynamic, and data-integrated diagnostic models.

Trust Disconnect Between Clinicians and Patients

Trust is foundational to clinical care; it underpins patient engagement, adherence, and therapeutic alliance^{[19][20]}. However, recent research and clinical practice reveal a **trust disconnect** in mental health:

- **Patients' Perspective:** Patients increasingly report skepticism regarding the accuracy of diagnoses and the individualized attention paid to their unique experiences^[20]. Mistrust is especially acute among marginalized groups who have faced historic bias or have experienced repeated "medication roulette."
- **Clinicians' Perspective:** Clinicians, conversely, face cognitive overload, time pressure, and system-driven imperatives that can push relationship-building to the background. Some studies reveal that clinicians rely on "tick-box" measures and rigid protocols at the expense of relational depth and empathy^[20].
- **Systemic Factors:** Health care consolidation, workflow-driven metrics, and increasing automation risk further subverting the centrality of trust. Clinical focus has shifted to disease treatment rather than holistic patient evaluation-leading to decreased perceptions of health care system trustworthiness^[20].

Consequences of Mistrust:

- Lower adherence to treatment
- Higher rates of dropout
- Reluctance to share sensitive information
- Decreased willingness to participate in collaborative or experimental interventions

Rebuilding trust thus emerges as a critical priority-and one in which technology, if applied carefully, can play a pivotal role.

From Dyads to Triads: AI-Assisted Triadic Diagnostic and Treatment Tools

The Shift: From Linear to Triadic, Data-Driven Models

Traditional models in mental health practice and technology have often failed to integrate the complexity and dynamism inherent in mental health phenomena^[21]. The rise of Triadic Framework Technology (TFT) signals a move from:

- Linear diagnosis (“this symptom leads to that disorder”)
 - Dyadic relationships (“clinician-patient”)
 - Unimodal data (“symptom checklist”)
- to
- Multivariate, triadic models (“symptom, context, and trajectory”)
 - Networked, systemic care involving patient, provider, and caregivers
 - Integrated, multimodal data analyzed by AI for pattern recognition and prediction

AI-Assisted Triadic Diagnostic Tools

Advances in artificial intelligence, particularly in natural language processing and predictive analytics, have equipped mental health with tools that can:

- Integrate data from clinical interviews, behavioral observations, genetic/biometric data, and collateral (family, social, cultural) information^{[23][25]}.
- Model not just symptom clusters, but **triadic relationships**-how personal history, environmental context, and present cognition interact to generate mental states.
- Predict with greater accuracy the likelihood of specific diagnoses and trajectories; for example, using machine learning models that analyze text from therapy notes or speech patterns to identify risk for depression or psychosis.

Resonance AI Tools, as being developed in public and open research such as the TriadicFrameworks repository, employ triadic modeling to parse multidimensional input data, calibrating diagnostic certainty not just by binary criteria but by resonance across three or more axes^[26].

Table: Traditional “Guessing” Diagnosis vs. TFT-Enhanced Resonance AI

Step	Traditional (Speculation-Based)	TFT-Resonance AI (Triadic)
Clinical Assessment	Interview + rating scale	AI-integrated, multi-source data harmonized

Diagnostic Decision	Single-clinician judgment, checklists	Triadic resonance across symptoms, context, hx
Confidence/Accuracy	Subject to bias and error	Quantified confidence based on triadic fit
Output	Binary/one-label diagnosis	Multidimensional, probability-weighted result

Analysis: TFT diagnostic tools are non-reductionist—they account for the interaction of personal, environmental, and behavioral variables. Case studies demonstrate such tools can detect subtle mood changes and high-risk patterns invisible to unaided clinicians, and adjust risk prediction in real-time with incoming data, reducing both false positives and negatives^[25].

AI-Assisted Triadic Treatment Planning Tools

The challenge of “pill roulette”—cycling through medications with only incremental adjustments—has plagued psychiatry for decades. AI-assisted triadic treatment planning tools—such as the AI Medical Matrix—transform this scenario:

- Machine learning analyzes historical treatment responses, pharmacogenetic data, and dynamic patient-reported outcome measures^{[27][29]}.
- The models incorporate at least three interactive data streams: patient biology, condition trajectory, and environmental/lifestyle variables.
- Outputs prioritize **personalized, evidence-driven interventions**, with predicted efficacy, side effect profiles, and compatibility with existing medications.

Such systems also facilitate shared-decision making by presenting patients, clinicians, and (when desired) caregivers with transparent risk-benefit analyses, thus enhancing engagement and trust^[10].

Table: Pill Roulette vs. TFT Medical AI Matrix Tools

Feature	Traditional Pill Roulette	TFT Medical Matrix
Medication Selection	Trial sequential monotherapies	AI-recommended triadic combos
Personalization	Limited; based on symptom clusters	High; integrates bio/psych/env
Side Effect Prediction	General estimate	Individualized, data-driven
Monitoring	Periodic, manual	Continuous, algorithmic

Elaboration: TFT medical matrix tools not only suggest better initial prescriptions, but also continuously update recommendations as new data emerge (e.g., adverse drug responses, efficacy markers, patient preferences), moving psychiatry from reactive to proactive care^[29].

Triadic Simulations in Pharmaceutical Testing

Another paradigm-altering application lies in pharmaceutical testing and development:

- **Traditional trials** are single-drug, placebo-controlled, costly, and often neglect the reality of polypharmacy in clinical populations^[30].
- **TFT-based triadic simulations** use AI to model drug-drug-drug interactions in silico, integrating data from molecular, behavioral, and demographic sources^{[32][34]}.

Table: Single-Drug Trials vs. Triadic Simulations

Feature	Single-Drug Trials	TFT Triadic Simulations
Study Design	Placebo-controlled monotherapy	In silico, multi-drug, dynamic combinations
Data Modeled	Drug + placebo	Drug x Drug x Drug + patient covariates
Cost & Time	High, multi-year	Low, rapid iteration
Clinical Relevance	Limited by exclusion criteria	High, models “real world” combinations

Analysis: Models such as those reviewed in the literature can forecast adverse drug reactions, optimize dosing, and guide trial design, all prior to expensive human testing. Recent advances with large-language models (LLMs) have dramatically improved sensitivity and specificity of DDI prediction (sensitivities >0.97), outstripping previous ML approaches^[33].

Shared Decision-Making and Self-Compassion: Triadic Human-AI Synergy

Shared Decision-Making (SDM) and Triadic Pathways

Modern evidence and new clinical measures confirm that including patients and caregivers in therapy planning-forming intentional triads-improves outcomes, satisfaction, and adherence^[10]^[11]. TFT tools operationalize this by:

- Structuring triadic SDM interactions-clinician, patient, and caregiver/family-using digital platforms that document, synthesize, and report multi-party input.
- Providing feedback loops: for instance, identifying when the patient’s or caregiver’s preference overrules clinician instinct in care planning.
- Supporting nuanced care transitions (e.g., from inpatient to outpatient) by dynamically incorporating real-time data and preferences from all involved parties.

Self-Compassion Pathways

Triadic self-compassion models-self-kindness vs. self-judgment, common humanity vs. isolation, mindfulness vs. over-identification-have been validated in both mental and physical health outcomes^{[13][14]}. AI tools can reinforce self-compassion practices by:

- Delivering just-in-time therapeutic interventions (e.g., guided meditations, cognitive reframing) personalized to the moment.
- Tracking bio- and neuro-markers to identify when self-criticism triggers exacerbation of symptoms and adjust interventions accordingly.
- Monitoring progress at the neurobiological level (gray matter changes, amygdala activity) as shown by contemporary neuroimaging studies.

TFT in Action: Example Comparisons

Diagnosis: Guessing vs. TFT Resonance AI Tools

Dimension	Guessing/Traditional Approach	TFT Resonance AI Approach
Inputs	Interview, rating scales	NLP on speech, biometric trends, context data
Bias	High; subject to clinician's lens	Minimized; pattern recognition across diverse data
Output	Binary label	Multidimensional, confidence-weighted result

Elaboration: In practice, clinicians may fail to distinguish between unipolar and bipolar depression based on fleeting interview cues, mischaracterizing risk. TFT-based tools can parse years of health data, environmental stressors, and biometric fluctuations in tandem, producing far more accurate screening and risk stratification.

Treatment Planning: Pill Roulette vs. TFT Medical Matrix

Dimension	Pill Roulette	TFT Medical Matrix AI Tool
First-Line Choice	Often SSRIs "by default"	Stratified by pharmacogenetics, comorbidity, history
Off-Label Use	Often untracked	Flagged and analyzed for risk-benefit instantly
Adherence Monitoring	Self-report, infrequent	Real-time digital/biometric feedback integrated

Practical Difference: Instead of months of failed medication trials, the TFT system predicts likely responders/non-responders and allows for more agile, supportive adjustment-with AI-powered support for both patient and provider.

Pharmaceutical Testing: Single-Drug Trials vs. Triadic Simulations

Trial Phase	Single-Drug Method	TFT Triadic Simulation
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Preclinical	Animal models, Petri dish	AI-based interaction mapping
Clinical	Monotherapy, long cycles	Multi-combination, in silico scenarios
Safety Monitor	Post-marketing registries	Live AI monitoring for emergent risks

Impact: TFT simulations can identify high-risk drug combinations and potential rare adverse events, streamlining clinical trial design and regulatory review, and improving clinical safety downstream.

The Business Case: Insurance Investment and Systemic Reform

Insurance Companies: Why Invest in TFT Tools?

Insurance companies are uniquely positioned to drive systemic reform and improve population health outcomes by investing in and deploying TFT-based tools^[35]:

- **Risk Management:** AI tools enhance risk stratification, reducing unnecessary costs from misdiagnosis or medication failures.
- **Utilization Review:** AI-powered utilization reviews can boost efficiency and ensure more appropriate resource allocation, while maintaining compliance with evolving regulatory frameworks.
- **Outcome-Based Models:** As healthcare shifts to value-based care, insurance carriers benefit from technologies that improve patient-clinician engagement and, thus, actual outcomes.
- **Fraud and Disparity Reduction:** AI oversight reduces the risk of discriminatory or arbitrary decision-making, as algorithms can be audited for bias and discrimination-provided that proper regulatory and ethical safeguards are in place^[36].

Business Opportunity Table

Opportunity Area	Traditional Approach	TFT Opportunity
Underwriting	Historical/paper records	Dynamic, AI risk models
Claims Review	Manual, inconsistent	Automated, data-integrated validation
Patient Engagement	Passive, mailings	Active, digital, personalized interactions
Fraud Detection	Retrospective, time lag	Real-time, pattern detection

Systemic Reform: Regulation, Ethics, and Standardization

The deployment of TFT tools must be matched with robust regulation that manages inherent ethical risks: privacy, data security, potential bias, and liability for AI-driven decisions^[36].

Emerging legislation (e.g., New York State's Assembly Bill A-9149, the European Union's AIA) is beginning to grapple with these concerns, requiring transparency and human oversight for AI in health systems. Insurers and developers are under increasing pressure to demonstrate their commitment to safety, fairness, and patient well-being.

Opportunities for TFT Developers and the Path to Systemic Impact

Development and Readiness Considerations

TFT technologies integrate AI, cloud-based data harmonization, behavioral modeling, and simulation tools. Their maturity can be assessed using frameworks such as Technology Readiness Levels (TRL), with most advanced TFT components currently at pilot to demonstration phases in clinical settings^[37]. Developers must focus on:

- **Open, Interoperable Architectures:** Facilitating integration across EHRs, pharmacy, wearable devices, and mental health platforms.
- **Multi-Stakeholder Design:** Engaging clinicians, patients, families, and payers in development to maximize usability and trust^[24].
- **Ethical AI Governance:** Building in mechanisms for bias auditing, explainability, and patient consent.
- **Agile Deployment:** Adopting hybrid SaaS/on-premise models that enable rapid scaling within and across health systems.

Systemic Reform Through Triadic Logic

Widespread adoption of TFT-and the triadic logic it implies-can catalyze deep reform:

- **Decentralization:** Shifting mental health care from top-down, prescriptive models to shared, participatory, and contextually adaptive practice.
- **Transdiagnostic Focus:** Moving away from siloed diagnostic labels towards dynamic modeling of mental health as the product of interacting personal, social, and systemic influences.
- **Continuous Learning Ecosystems:** Positioning AI as a partner in ongoing clinical learning-updating models as new data, therapies, and stakeholder needs emerge.

Conclusion

Triadic Framework Technology embodies a paradigm shift in mental health-moving from static, reductionist models to dynamic systems capable of modeling, predicting, and influencing complex human experiences. By operationalizing the legacy of cognitive triads, family systems, and integrating recent advances in AI, TFT offers a quantum leap in diagnosis, treatment planning, pharmaceutical development, and systemic trust.

The case for adoption is supported across multiple domains: the empirical inadequacy of current speculation-based approaches, mounting evidence for AI-enhanced triadic models, and the compelling economic and quality gains achievable for insurers and health systems. Insurance companies and pharmaceutical developers that invest early in TFT will gain not only competitive edge but also catalyze a transition toward more equitable, personalized, and effective mental health care.

Yet adoption must be matched by a commitment to regulatory, ethical, and collaborative stewardship. The future of mental health care lies not just in more technology-but in smarter, more systemic, and more relational technology; technology that recognizes, models, and leverages the inherent complexity and interconnectedness at the heart of mental well-being.

Example Tables: Side-by-Side Summary

Table 1: Diagnosis-Traditional Guesswork vs. TFT Resonance AI

Step	Traditional Approach	TFT-Enhanced Resonance AI
Assessment	Clinician interview, checklist	AI fuses multi-source, multi-modal inputs
Decision	Subjective, single diagnosis	Weighted, triadic correlation, multidimensional
Accuracy	Prone to bias/error	Higher, validated by continuous data
Output	Static diagnosis	Dynamic, personalized, and explainable

Table 2: Treatment Planning-Pill Roulette vs. TFT AI Matrix

Step	Pill Roulette Tradition	TFT Medical AI Matrix
First Prescription	Default or broad guidelines	Personalized via AI pattern recognition
Monitoring	Manual, infrequent	Continuous, algorithmic adjustments
Adherence	Self-report, unreliable	Wearables, digital tracking
Adjustments	Sequential, slow	Rapid, data-driven, multi-parametric

Table 3: Pharmaceutical Testing-Single-Drug Trials vs. Triadic Simulations

Test Stage	Single-Drug Approach	TFT Triadic Simulation
Design	Placebo controlled, one-medicine	Multi-agent, interaction mapped
Prediction	Limited	AI models DDI, DDI, patient covariates
Scalability	Low, cost-intensive	High, cost-effective
Clinical Relevance	Questionable with polypharmacy	High, real-world, combination ready

The race to transform mental health care is on. Triadic Framework Technology, representing the convergence of theoretical, clinical, and technological innovation, offers the clearest blueprint for

navigating its inherent complexity. The leap, now, is from dyads to triads, from guesswork to resonance, and from speculation to systemic insight.

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