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Transforming Underwriting and Customer Experience in Life Insurance with Generative and Agentic AI

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Executive Summary

The life insurance industry is entering a period of meaningful transformation. Seventy-eight percent of insurers expect to increase AI spending, and generative AI (GenAI) and agentic AI are creating new possibilities for underwriting and customer experience. Across industry, carriers are exploring how these technologies can enhance operations. Some are moving aggressively, and others are taking measured first steps, but the direction of travel is clear.

Early adopters are beginning to see encouraging results: faster underwriting decisions, improved fraud detection accuracy, and stronger customer engagement through more personalized interactions. However, the path forward is not simply about deploying the latest AI models. It requires building robust data infrastructure, implementing continual testing frameworks, and, more critically, thoughtfully integrating AI capabilities with human expertise rather than replacing it.

In Datos Insights' ongoing conversations with carrier CIOs and technology leaders, AI has become the dominant topic. Yet half of insurance CIOs report feeling behind their peers in AI adoption. This reflects how rapid expectations are shifting and how varied the starting points are across the industry. Some carriers have made significant strides in specific areas like customer service automation while others are still working through governance frameworks necessary to bring customer data into AI models.

This paper explores how life insurers are beginning to harness GenAI and agentic AI to enhance core operations, examines the data foundations and governance practices needed for sustainable success, and highlights the importance of AI-human collaboration as the model for lasting transformation.

AI-Human Collaboration: The Model for Insurance Transformation

AI is not redefining insurance by replacing expertise, but by reshaping how expertise is applied. The most effective operating models are emerging where human judgment and AI-driven insight work in tandem to improve speed, consistency, and decision quality.

Augmentation Over Replacement

The most successful AI implementations in insurance share a common characteristic: they augment human decision-making rather than attempt to replace it. This is especially true in life insurance underwriting, where the stakes of individual decisions are high and the complexity of risk assessment often demands experienced judgment that AI alone cannot replicate.

As Datos Insights highlighted in its 2026 insurance technology trends research, AI-human collaboration is emerging as a defining theme for the industry. The workforce is evolving, experienced underwriters are retiring, new professionals are entering the field with different technological expectations, and the volume and complexity of data informing decisions continues to grow. AI serves as a bridge, enabling less-experienced staff to make better decisions faster while allowing seasoned professionals to focus on the complex cases in which their expertise adds the most value.

This collaborative approach also addresses a real concern among carriers: the fear that AI adoption means wholesale disruption. In reality, technology is most effective when positioned as an enabler, managing routine data processing, surfacing relevant insights, and providing decision support, while humans retain authority over judgment calls, relationship management, and exception handling. Carriers that frame their AI strategy around this partnership model consistently see higher adoption rates and faster time to value.

For technology providers, this means the most impactful solutions are those designed as collaborative partners in a carrier's transformation journey rather than stand-alone systems that demand immediate wholesale process redesign. The key is to enable continual transformation capabilities that will, overtime not only transform wholesale processes but

enable the ability to keep up with needed transformation to support efficiencies and required improved user experiences. A growing number of technology providers now offer underwriting platforms designed natively for AI–human collaboration, enabling carriers to adopt capabilities incrementally while maintaining compliance and auditability. The providers seeing the strongest traction are those who invest in understanding each carrier's unique starting point, support phased adoption, and build tools that enhance rather than displace existing expertise.

Emerging Impact: Where Carriers Are Seeing Results

AI adoption in life insurance is moving beyond experimentation into measurable business impact. While still early, carriers are beginning to see tangible improvements across underwriting, risk assessment, fraud detection, and customer engagement.

Early Wins Across the Value Chain

The business case for AI in life insurance is moving from theoretical to tangible. While the industry is still in initial stages overall, a growing number of carriers are demonstrating meaningful outcomes in targeted areas.

Underwriting Transformation

A large Tier-1 life and annuities carrier in the U.S. reduced policy issuance time by 20% for the healthiest risk class through predictive modeling. Additionally, this carrier now issues policies in as little as 20 minutes compared to the traditional weeks or months. The key is AI-driven underwriting systems that analyze medical records, lifestyle data, and historical claims to assess risk with greater speed and accuracy, while keeping experienced underwriters in the loop for complex cases and final validation.

A Tier-2 property and casualty (P/C) carrier experienced a 113% uplift in underwriting team productivity and reduced service-level agreement (SLA) quote turnaround time for strategic partners from 24 hours to just 2 hours after implementing AI-powered underwriting workbench capabilities. These gains are significant, but equally important, they were achieved by enhancing underwriter workflows rather than bypassing them.

Enhanced Risk Assessment and Mortality Modeling

Machine learning models are beginning to predict claim likelihood more effectively than traditional actuarial methods alone by analyzing diverse data sets, including health records, financial data, and behavioral patterns. In the P/C space, insurers implementing predictive modeling have seen a 67% improvement in risk assessment accuracy. Life insurers are exploring similar methodologies to price policies more precisely, reducing both overpricing that drives away healthy applicants and underpricing that erodes profitability.

Fraud Detection and Prevention

Insurance fraud costs the U.S. industry US$308.6 billion annually across all lines. AI is proving to be a powerful tool against this persistent challenge. Machine learning models can analyze application forms, behavioral patterns, and third-party data sources to flag inconsistencies that indicate potential fraud before policies are even issued, preventing financial losses while improving overall portfolio risk quality.

Personalized Policyholder Interactions

Carriers are exploring AI-driven recommendation engines and intelligent chatbots that can surface relevant products in real time, manage routine inquiries 24/7, and free human agents to focus on complex cases and relationship building. When done well, these tools improve both efficiency and customer experience, a combination that supports advisor satisfaction and distribution strength.

The Workbench Evolution: Where AI Meets Underwriting Practice

As AI capabilities mature, the underwriting workbench is becoming the focal point where data, decisioning, and workflow converge. This evolution is transforming how underwriters interact with information and execute decisions in real time.

Modern Underwriting Demands Integrated Tools

The underwriting workbench is evolving into the central hub for AI-powered underwriting operations. These platforms are moving beyond static, disconnected tools toward dynamic, AI-enabled environments that integrate data, decisioning, and workflows in real time. Carriers that invest in these integrated environments are seeing measurably higher adoption rates and operational efficiency gains—in some cases, achieving adoption levels above 85% within the first six months of deployment.

These are some of the capabilities that carriers are exploring:

- **Unified data view and integration:** Modern workbenches consolidate information from policy administration systems, medical databases, third-party data providers, and document repositories into a single interface. This eliminates the productivity drain of switching among multiple systems and reduces errors from manual data entry. Data fabric technology enables workbenches to connect disparate data sources without complex migrations, creating an integrated environment that supports both human decision-making and AI-assisted analysis.
- **AI-Powered document processing:** Intelligent document processing (IDP) capabilities automatically extract and classify information from applications, medical records, and supporting documents. This goes beyond basic optical character readers (OCR); it is contextual understanding that can interpret medical terminology, identify inconsistencies, and flag missing information. When paired with human review, IDP saves significant underwriter time while improving data accuracy.
- **360° risk assessment with human oversight:** Advanced workbenches provide centralized risk views with real-time insights and AI-assisted decision support. They integrate with third-party data sources and rules engines to give underwriters a comprehensive picture for faster and more accurate decisions. Critically, the most

effective implementations today maintain human-in-the-loop validation, especially for high-stakes underwriting decisions where experienced judgment remains essential. Increasingly, technology providers are collaborating with carriers to integrate each carrier's own underwriting guide or manual directly into the 360-degree risk view. This enables underwriters to apply carrier-specific rules, product nuances, and risk tolerances as part of the assessment workflow, strengthening consistency, auditability, and decision quality.

- **Smart work allocation and triage:** AI algorithms analyze incoming submissions and automatically route them based on complexity, underwriter expertise, and current workload. Straightforward cases that meet straight-through-processing criteria can be managed with minimal human intervention, while more complex cases are assigned to the most qualified underwriters. This ensures that underwriting resources stay focused on high-value decision making rather than administrative tasks. Increasingly, technology providers play a key role in enabling this capability by collaborating with carriers to configure advanced triage logic, integrate carrier-specific rules and workflows, and optimize routing models. This collaboration ensures that AI-driven submission handling aligns with each carrier's unique risk appetite, operational priorities, and governance requirements, resulting in more consistent, efficient, and scalable underwriting operations.

- **Continuous learning and feedback:** The most effective workbenches incorporate feedback loops that allow AI models to learn from underwriter decisions and outcomes. When an underwriter overrides an AI recommendation, the system captures the reasoning and uses it to refine future recommendations. This creates a virtuous cycle in which AI becomes increasingly valuable over time and human expertise directly improves technological performance while increasing transparency across the insurance value chain.

Building the Foundation: Data Infrastructure for AI Success

Sustainable AI success is not driven by models alone, but by the strength of the underlying data foundation. Carriers must modernize how data is structured, governed, and accessed to fully unlock AI-driven value.

The Critical Role of Intelligent Information Management

AI performance is fundamentally constrained by data quality and accessibility. As Datos Insights research on intelligent information management emphasizes, carriers need comprehensive approaches that unify enterprise content management, business process automation, and data governance. Without this foundation, even the most sophisticated AI models will underperform.

Three Pillars of AI-Ready Data Infrastructure

AI-ready data infrastructure requires architectures that can support high-volume, unstructured, and real-time data at scale. These three pillars define the foundational capabilities carriers must establish to enable consistent, high-quality AI outcomes.

Pillar 1: Comprehensive Content Management

Life insurers manage vast amounts of unstructured content (applications, medical records, correspondence, policy documents) alongside structured data. AI-enabled content management systems actively prepare this content for machine learning consumption through robust version control, document relationship tracking, and rich metadata enrichment. Carriers exploring these capabilities find that getting the content management foundation right is often the most critical—and most underestimated—step in their AI journey.

Pillar 2: Master Data Management Within Data Lakes

Modern life insurers are building data lakes that combine structured data from core systems with unstructured content from various sources. However, these lakes require sophisticated master data management (MDM) to ensure consistency and quality through data lineage tracking, quality scoring, and semantic enrichment. Without MDM discipline, data lakes risk becoming data swamps that degrade rather than enhance AI performance.

Pillar 3: Metadata as the AI Multiplier

As Datos Insights' research on Document and Metadata Governance for AI makes clear, metadata enrichment drives GenAI effectiveness. For retrieval-augmented generation (RAG) systems, which many insurers are exploring with their AI partners to ground GenAI responses in their own data, metadata quality directly determines output accuracy. Beyond basic document properties, AI systems require rich contextual metadata including document lineage, validity periods, and relationships to other documents. Without proper metadata, RAG systems may reference outdated policies, superseded documents, or incomplete information.

Beyond Deployment: The Imperative of Continuous Testing

Deploying AI is not a one-time milestone but an ongoing operational responsibility. Carriers must establish continuous testing, monitoring, and refinement practices to ensure models remain accurate, compliant, and aligned with evolving business conditions.

Why "Set It and Forget It" Does not Work for AI

One of the most critical, and often overlooked, aspects of successful AI deployment is ongoing testing and monitoring in production environments. Deploying AI is not a one-time event; it is the beginning of a continuous management responsibility. As Datos Insights' research on model governance emphasizes, programs must include ongoing monitoring, updating, and retirement processes for AI systems. This is also an area in which modernizing your system requires a long-term technology provider that can collaborate with you and guide both system evolution and workforce transformation toward a shared goal, ensuring models remain accurate and aligned over time.

Model Drift and the Evolving Landscape

AI models are trained in historical data, but the environment does not stand still. Customer demographics shift, medical treatment protocols evolve, economic conditions change, and fraud tactics become more sophisticated. All of these changes can cause model drift, where a model's assumptions no longer align with reality, which leads to degraded performance. Carriers that invest in solutions that support drift detection and systematic retraining are better positioned to maintain the accuracy and reliability of their AI systems over time.

The Unique Challenges of LLMs and GenAI

Large language models (LLMs) present additional monitoring challenges due to their non-deterministic nature. Unlike traditional machine learning models that produce consistent outputs for given inputs, LLMs can generate different responses each time. Effective monitoring requires tracking response quality and relevance, detecting hallucinations and factual errors, and monitoring for bias—all of which benefit from human oversight as part of a structured quality assurance process.

Building a Testing Culture

Successful continuous testing requires a combination of real-time monitoring dashboards that provide visibility into model performance and business metrics, automated alert systems that trigger notifications when metrics fall outside acceptable ranges, regular model retraining schedules using recent data to combat drift, and A/B testing capabilities that enable careful rollout of model updates. Carriers that demand these capabilities in their AI programs from the start, rather than bolting them on after deployment, will consistently see better long-term outcomes.

Learning From P/C: Use Cases and ROI Insights

The P/C sector's AI implementations offer valuable reference points for life insurers exploring their own transformation paths.

Accelerated Claims Processing

P/C insurers use computer vision and machine learning to automate damage assessment. Life insurers can explore similar approaches to accelerate claims processing, using AI to extract information from death certificates and medical records, validate claim documentation, and detect potential fraud patterns, while maintaining human review for complex or sensitive cases.

Dynamic Risk Pricing

Telematics and usage-based insurance in auto insurance demonstrate how continuous data streams can enable more responsive pricing. Life insurers are beginning to explore similar models using wearable device data, wellness program participation, and lifestyle information to supplement traditional risk factors. This is an area in which AI-human collaboration is essential to balance data-driven insights with underwriting judgment.

Predictive Analytics for Retention and Prevention

P/C insurers use predictive models to identify high-risk situations and proactively intervene. Life insurers can apply similar thinking to identify policyholders at risk of lapsing, detect early warning signs that inform wellness interventions, and flag policies likely to develop into claims, enabling proactive rather than reactive portfolio management.

Roadmap to Success: A Practical Approach to AI Adoption

AI transformation is not achieved through a single initiative, but through a structured progression of capabilities over time. Carriers that take a phased, practical approach are better positioned to build momentum, demonstrate value, and scale effectively.

Meeting Carriers Where They Are

Successful AI transformation does not happen overnight, and it does not require carriers to have all capabilities in place from day one. The industry is at varying stages of maturity, and the most effective approach is a phased one that builds momentum through targeted wins. You can conduct the following phases yourself or collaborate with a reliable vendor partner. Many vendors are already advanced in developing models and offering ready-made AI solutions.

Phase 1: Assess and Build Foundations

Evaluate current data infrastructure and identify gaps. Establish AI governance policies and oversight structures. Build cross-functional teams that bring together underwriting, IT, data science, and compliance. Select initial use cases with clear ROI potential and develop proof-of-concept projects to demonstrate value and build organizational confidence.

Phase 2: Pilot and Learn

Launch pilot projects in controlled environments with strong human oversight. Implement monitoring and testing frameworks from the start. Train teams on AI tool usage and interpretation, emphasizing the collaborative model where AI supports rather than replaces human expertise. Gather feedback, refine approaches, and document lessons learned to build the business case for expansion.

Phase 3: Expand and Optimize

Scale successful pilots to broader populations. Integrate AI capabilities into core workflows. Begin exploring more advanced capabilities such as agentic AI and multi-agent systems. Continually refine models based on production data and underwriter feedback. Establish centers of excellence for ongoing innovation.

Critical Success Factors

Several factors consistently differentiate carriers that gain traction with AI from those that struggle:

- **Executive sponsorship and clear vision:** AI transformation requires strong leadership support to overcome organizational resistance, secure funding, and drive cultural change. Successful initiatives have C-suite champions who communicate a clear vision of AI as a collaborative tool that enhances the workforce rather than displaces it.
- **Cross-functional collaboration:** AI initiatives struggle when they remain IT projects divorced from business operations. Success requires close partnership between underwriters, actuaries, data scientists, IT professionals, compliance teams, and business leaders, each bringing essential perspectives and domain expertise.
- **Investment in people:** Technology alone does not drive transformation. Organizations must invest in training existing employees on AI capabilities, developing new roles that bridge technical and domain expertise, and creating career paths that reward AI fluency. As the workforce evolves with new professionals entering the field who have grown up with technology, organizations that invest in their people's ability to work alongside AI will see the strongest returns.
- **Choosing the right partners:** Carriers should look for technology providers that can be a collaborative partner in their transformation journey, those who understand the insurance domain, support phased adoption, and build solutions designed for AI-human collaboration. The strongest partnerships are those in which the provider invests in understanding the carrier's unique situation and delivers solutions that enhance existing capabilities rather than demanding wholesale replacement.

Conclusion: Embracing the Journey

The AI transformation in life insurance is real, it is accelerating, and carriers across the industry are actively exploring how to harness its potential either internally or through trusted technology partnerships. But this is a journey, not a destination, and the carriers that will succeed are those that approach it thoughtfully rather than trying to do everything at once.

Datos Insights expects that by late 2026, AI-enabled underwriting and customer engagement capabilities will increasingly be viewed as table stakes rather than competitive differentiators. The window for building competitive advantage through early adoption is open, but it will not remain open indefinitely.

The most important insight from carriers that are furthest along this path is that success comes from the combination of technology and people. AI-human collaboration is not just a strategy; it is the operating model that delivers sustainable results. Carriers that invest in the right data foundations, implement continuous testing and monitoring, choose collaborative technology partners, and empower their workforce to work alongside AI will be best positioned for the future.

The technology is maturing rapidly. There is evidence supporting the effectiveness of these use cases. And the carriers that take measured, deliberate steps today, starting where they are and building methodically, will define the next era of life insurance.

About Sapiens

Sapiens International Corporation N.V. provides SaaS-based software solutions for insurers, with a focus on life and annuities, as well as property and casualty, workers' compensation, and reinsurance markets. The company delivers a platform supporting end-to-end operations across the policy lifecycle, including illustration, digital application, underwriting, policy administration, and data and analytics, with capabilities aligned to life and annuity product and distribution models.

The platform is built on a modular, API-enabled architecture, enabling insurers to deploy capabilities incrementally while maintaining integration across core and digital functions. Embedded AI and automation support underwriting, decisioning, and operational efficiency. Sapiens serves over 600 insurers in more than 30 countries and operates within a partner ecosystem that includes cloud and system integration providers.

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