Accelerating Modernization and Efficiency in Life Insurance: Leveraging AI Platforms for Transformation

Whitepaper by

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The life insurance industry stands at a critical inflection point today, facing challenges that demand a fundamental rethinking of technological approaches. Legacy systems that have served the industry for decades are increasingly becoming liabilities rather than assets, hampering innovation and operational efficiency. The convergence of shifting customer expectations, competitive pressures from InsurTechs and the need for greater business agility has created an urgent imperative for modernization.

1. The Modernization Imperative for Life Insurance Carriers

Life insurance carriers operate in an environment unlike any other in the financial services sector. Their products are complex, long-term commitments that often span decades. Systems must support policies sold 30+ years ago alongside new offerings. The industry faces significant longevity risk as improvements in mortality rates directly impact the sustainability of long-term commitments, particularly in annuity products. The systems supporting these products have typically evolved over similar timeframes, resulting in a technological landscape characterized by monolithic architecture, outdated programming languages and siloed data repositories. This legacy burden is not merely a technical challenge. It represents an existential threat to business competitiveness and growth.

1.1 Growing Technology Debt

The life insurance sector faces a particularly challenging landscape of aging core systems. Many carriers still rely on applications written in COBOL, PL/I, ASM, Natural and other legacy languages hosted on mainframe environments that date back 30+ years. These systems, while reliable workhorses, impose severe limitations:

- Prohibitive maintenance costs that consume large percentages of IT budgets.
- Limited talent pool as developers with expertise in legacy technologies retire.
- Inflexible architectures that resist integration with modern technologies.
- Slow time-to-market for new products and services.
- Barriers to implementing data analytics and AI capabilities

Most significantly, these legacy systems encapsulate decades of business logic and domain knowledge that is often poorly documented and increasingly held in the institutional memory of an aging workforce. As these subject matter experts retire, insurance carriers risk losing the very knowledge that powers their core operations.

1.2 Shifting Customer Expectations

Today's life insurance customers demand experiences that match what they receive from technology leaders in other sectors. They expect pervasive user interfaces, self-service capabilities and innovative insurance products that are competitively priced. The digital natives now entering their prime insurance-buying years have little patience for paper-based processes, lengthy underwriting or opaque policy management.

1.3 Regulatory and Compliance Rigidities

The regulatory landscape adds another layer of complexity to modernization efforts. As regulators focus on addressing emerging risks like longevity risk in life insurance and annuity products, compliance requirements continue to evolve.

1.4 Data Fragmentation and Silos

Data silos severely impact the insurance industry's ability to leverage its vast information assets. Different departments often use separate technology stacks, creating insurmountable barriers between teams. This fragmentation leads to data inconsistencies and conflicting information, inability to make data-driven decisions, duplicated efforts and process inefficiencies and a lack of visibility into the complete customer journey.

1.5 The Dual-Platform Dilemma

One of the most challenging aspects of life insurance modernization is the 'dual-platform dilemma'. This refers to the need to modernize systems for new products while simultaneously maintaining legacy platforms that support 'in force' business. Life insurance policies remain in force as long as premiums are paid, which can span decades. Sometimes, even after a product is off the shelf, closed blocks must continue to be serviced, with features, riders or calculations no longer supported by modern systems. This creates several challenges:

- The necessity to maintain multiple technology stacks.
- Increased operational costs and complexity.
- Integration challenges between old and new systems.
- Talent shortages for maintaining legacy systems

Insurance firms face a critical decision between building entirely new platforms or wrapping legacy systems with modern technology layers. Both approaches have merits and risks.

Life insurers must respond to these expectations to remain competitive, making it imperative to have nimble IT application platforms focused on business capabilities and delivery agility.

2. Continuous Modernization

Leading carriers no longer treat modernization as a one-time project. Instead, they continually modernize their systems to leverage new technologies and address changing business needs.

2.1 The AI-Driven Path to Modernization

Traditional approaches to modernization, which often involve 'black box' conversions or high-risk 'rip and replace' strategies, are increasingly giving way to more nuanced, AI-driven transformations that preserve business knowledge while enabling digital innovation.

Generative AI has emerged as a transformative force in software development and system modernization. Unlike previous waves of automation that focused on routine, rule-based tasks, generative AI can understand, contextualize and enhance complex business logic embedded in legacy systems.

By harnessing cutting-edge AI technologies, insurers can enhance operational efficiencies, mitigate risks and provide superior customer experiences. This represents a significant opportunity for life insurance carriers seeking to modernize their technology stacks, while preserving decades of accumulated business knowledge.

3. The Mphasis Approach to AI-Driven Modernization

Successful modernization in life insurance requires more than just technology replacement. It demands a comprehensive approach that preserves institutional knowledge, clarifies business requirements and accelerates development, all while maintaining business continuity.

This is where Mphasis' suite of AI-powered platforms offers a compelling solution. Our integrated approach addresses the full modernization lifecycle through three specialized AI platforms:

For enterprise modernization	For requirements engineering	For software engineering
Mphasis NeoZeta	Mphasis NeoSciBe	Mphasis NeoCrux

4. Enterprise Modernization with Mphasis NeoZeta™

At the foundation of any successful modernization initiative lies the ability to extract, understand and preserve the business knowledge embedded in legacy systems. This is where Mphasis NeoZeta™, Mphasis' Generative AI-based Enterprise Modernization Platform, makes its most significant contribution.

4.1 Beyond Code Conversion: A Knowledge-First Approach

NeoZeta™ distinguishes itself from conventional modernization tools by focusing on knowledge extraction rather than mere code conversion. It's not an AI-powered code converter but an innovative platform that tackles the challenge of enterprise application modernization holistically.

What makes Mphasis NeoZeta™ particularly valuable for life insurance carriers is its ability to unleash enterprise knowledge hidden in both code and non-code artifacts such as domain and architecture documents, and other technical documentation. This comprehensive approach ensures that the decades of domain expertise embedded in legacy systems aren't lost during modernization.

4.2 Transparency in Modernization

One of the key features of Mphasis NeoZeta™ is its transparency. Unlike 'black box' approaches that provide little visibility into the transformation process, Mphasis NeoZeta™'s design, with the help of open standards and knowledge graph technologies, ensures both humans and AI agents can participate in the modernization journey.

This transparency is critical for life insurance carriers, where understanding the rationale behind specific business rules and calculations is often as important as the rules themselves. By making the modernization process transparent, Mphasis NeoZeta™ allows subject matter experts to validate the extracted knowledge, ensuring that business logic is accurately preserved.

4.3 Quantifiable Benefits for Life Insurers

For life insurance carriers, Mphasis NeoZeta™ offers several compelling benefits:

- **Reduced Modernization Costs**: By leveraging enterprise knowledge, it can lower the time of relearning by 50% or more, and the cost of per-line-of-code modernization by 60% or more. This dramatic cost reduction makes previously unaffordable modernization initiatives economically viable.
- **Broad Language Support**: It supports relearning from COBOL, Natural, and soon Java and C#, covering the most common languages used in life insurance legacy systems.
- **AI-Assisted Validation**: It supports AI-assisted validations by subject matter experts at all stages of the modernization journey, ensuring that institutional knowledge is accurately preserved.
- **Knowledge Preservation**: The platform extracts business knowledge not just from code, but also from non-code technical artifacts, providing a more comprehensive understanding of the system. Knowledge Graphs generated by Mphasis NeoZeta™ are useful assets for organizing knowledge and enabling complex analyses. They provide enterprises with a model of how everything is related, having each subject or object represented only once with all its relationships, in the context of all of the other subjects and their relationships. This makes it possible to see how everything is related at a big picture level.

Mphasis NeoZeta™ programs across diverse industries have demonstrated their ability to adapt to individual organization taxonomies successfully, making them well-suited for the complex business logic typical of life insurance applications.

5. Requirements Engineering with Mphasis NeoSaBa™

Once legacy knowledge has been extracted and preserved using Mphasis NeoZeta™, the next challenge is to translate this knowledge into clear, actionable requirements for modern application development. This is where Mphasis NeoSaBa™ enters the modernization workflow.

5.1 Bridging Legacy Knowledge and Modern Development

Mphasis NeoSaBa™ serves as the crucial bridge between the knowledge extracted by NeoZeta™ and the development acceleration provided by Mphasis NeoCrux™. It takes the business logic and domain knowledge preserved by Mphasis NeoZeta™ and transforms it into structured, unambiguous requirements and user stories that can guide modern application development.

5.2 Creating Unambiguous Requirements

A significant challenge in any modernization initiative is ensuring that business requirements are clearly understood and correctly implemented. This is particularly important in life insurance, where subtle misinterpretations can lead to material financial impacts.

Mphasis NeoSaBa™ addresses this challenge by leveraging AI to create unambiguous requirements specifications from the knowledge extracted by Mphasis NeoZeta™. It analyzes business logic, data flows and domain-specific concepts to create clear, consistent requirement documents that leave little room for misinterpretation.

5.3 User Stories for Agile Development

Beyond basic requirements documentation, Mphasis NeoSaBa™ also generates user stories that align with modern agile development practices. These user stories follow the established format of 'As a [type of user], I want to [perform some action] so that [some reason or benefit]', ensuring that development remains focused on delivering value to end users.

This user story format helps ensure that each requirement is captured in a feature-oriented, value-focused way, rather than a solution-oriented way. By focusing on the 'what' and 'why' rather than the 'how', Mphasis NeoSaBa™ gives development teams the flexibility to implement modern solutions while ensuring that critical business functionality is preserved.

5.4 Benefits of Life Insurance Modernization

For life insurance carriers, Mphasis NeoSaBa™ offers several key advantages:

- **Knowledge Continuity**: It ensures that the domain knowledge extracted from legacy systems by Mphasis NeoZeta™ is accurately preserved and translated into requirements for modern development.
- **Reduced Ambiguity**: By creating clear, unambiguous requirements, Mphasis NeoSaBa™ reduces the risk of errors or misinterpretations in the modernization process.
- **Agile Enablement**: The generation of user stories facilitates the adoption of agile development practices, increasing the agility and responsiveness of IT teams.
- **Traceability**: It maintains traceability between legacy functionality and new requirements, ensuring that nothing is inadvertently lost in the modernization process.

6. Accelerating Development with Mphasis NeoCrux™

With legacy knowledge preserved by Mphasis NeoZeta™ and requirements clarified by Mphasis NeoSaBa™, the final phase of modernization is implementing the new solutions efficiently. This is where Mphasis NeoCrux™, Mphasis' AI-powered software engineering platform, provides significant value.

6.1 AI-Driven Software Engineering

Mphasis NeoCrux™ is an industry-first platform designed to enhance software development productivity through several key mechanisms. Mphasis NeoCrux™ Agent Orchestrator leverages generative AI to streamline workflows and reduce inefficiencies. The platform extends beyond basic agent orchestration; it is fueled by powerful personalized AI assistance that learns and adapts to individual engineers' behaviors. This personalization increases productivity by tailoring assistance to each developer's unique working style and knowledge areas.

6.2 Reduced Context Switching

Mphasis NeoCrux™ integrates disparate development tools into a single interface, eliminating the need to toggle between multiple platforms. Developers access code repositories, testing frameworks, project backlogs, code analyzers, application monitors, CI-CD pipelines and AI code assistants (like GitHub Copilot, Cody, Gemini, Amazon Q) through a unified view. This consolidation keeps engineers focused on their IDE, reducing productivity losses from constant tool-switching, a problem that typically consumes 20-30% of development time.

6.3 AI-Driven Code Reusability

Mphasis NeoCrux™ platform's AI analyzes existing codebases to identify reusable patterns, suggesting pre-validated snippets or architectural components. For example, Mphasis NeoCrux™:

- Recognizes repetitive code blocks and proposes optimized alternatives.
- Surfaces relevant modules from past projects, reducing redundant development.
- Enables architects to publish reusable patterns as code templates.

6.4 Flexible Multi-Agent Orchestration

Unlike single-agent AI tools, Mphasis NeoCrux™ allows engineers to integrate specialized AI agents for specific tasks (e.g., code generation, testing, documentation). Benefits include:

Task-specific Optimization: Use bespoke AI models for code reviews vs. requirements gathering.

Adaptive Workflows: Switch agents dynamically based on project phase (e.g., sprint planning vs. deployment).

Enterprise-grade Customization: Tailor agents to organizational coding standards.

6.5 Personalized AI Assistance

Mphasis NeoCrux™ learns individual developers' behaviors to deliver context-aware support:

- Recommends frequently used code patterns based on a developer's history.
- Auto-generates prompts for AI interactions, reducing manual input.
- Adapts to preferred frameworks/languages, accelerating onboarding.

6.6 Accelerated Idea-to-Launch Velocity

Adopters report **40% improvement** in developer productivity and **60% faster** Idea-to-Launch cycles. These gains stem from automated workflows for code reviews, dependency checks and release management, coupled with real-time collaboration features that sync developers, QA engineers and product owners.

6.7 Enterprise-Grade Governance

The platform embeds guardrails to maintain quality:

- Enforces coding standards via AI-powered linting.
- Tracks technical debt across projects.
- Provides C-suite visibility into development bottlenecks through analytics dashboards.

By addressing these pain points, Mphasis NeoCrux™ enables life insurance developers to focus on high-value tasks like feature innovation rather than repetitive coding, critical for modernizing legacy systems while maintaining regulatory compliance.

6.8 Mphasis AI Platforms Address Systemic Pain Points

Core Challenge	AI-Driven Solution	Operational Impact
Product Complexity & Longevity	Mphasis NeoZeta™ extracts embedded business logic from legacy systems into actionable knowledge graphs.	Preserves decades of actuarial models while enabling modern product development.
Data Silos	API-first integration layers + Mphasis NeoZeta™ generated knowledge graphs unify data assets.	Enables 360° customer views while maintaining legacy data integrity.
Dual-Platform Dilemma	Mphasis NeoCrux™ allows parallel development: legacy maintenance & modern stack innovation.	Reduces context switching costs, while maintaining in-force policy compliance.
Customer Experience Gaps	Mphasis NeoSaBa™ translates legacy rules into agile user stories for digital experience teams.	Accelerates CX improvements from half-yearly or quarterly releases to as frequent as necessary.
Regulatory Rigidity	Traceability matrices in Mphasis NeoSaBa™ map legacy compliance rules to modern implementations.	Reduces audit preparation time while maintaining compliance.

7. Operations Intelligence with Mphasis AI Platforms

Knowledge graphs provide structured, contextualized data relationships that enable:

- **Root Cause Analysis**: Map dependencies between legacy systems, microservices and infrastructure components to accelerate incident resolution.
- **Predictive Maintenance**: Identify patterns in application performance data to forecast system failures.
- **Automated Remediation**: Trigger predefined workflows when specific nodes/relationships in the graph show anomalies.

This can help in converting decades of legacy system knowledge (extracted by Mphasis NeoZeta™) into operational intelligence that powers:

- 60% faster MTTR (Mean Time to Repair) through dependency mapping.
- 40% reduction in production incidents via predictive analytics.

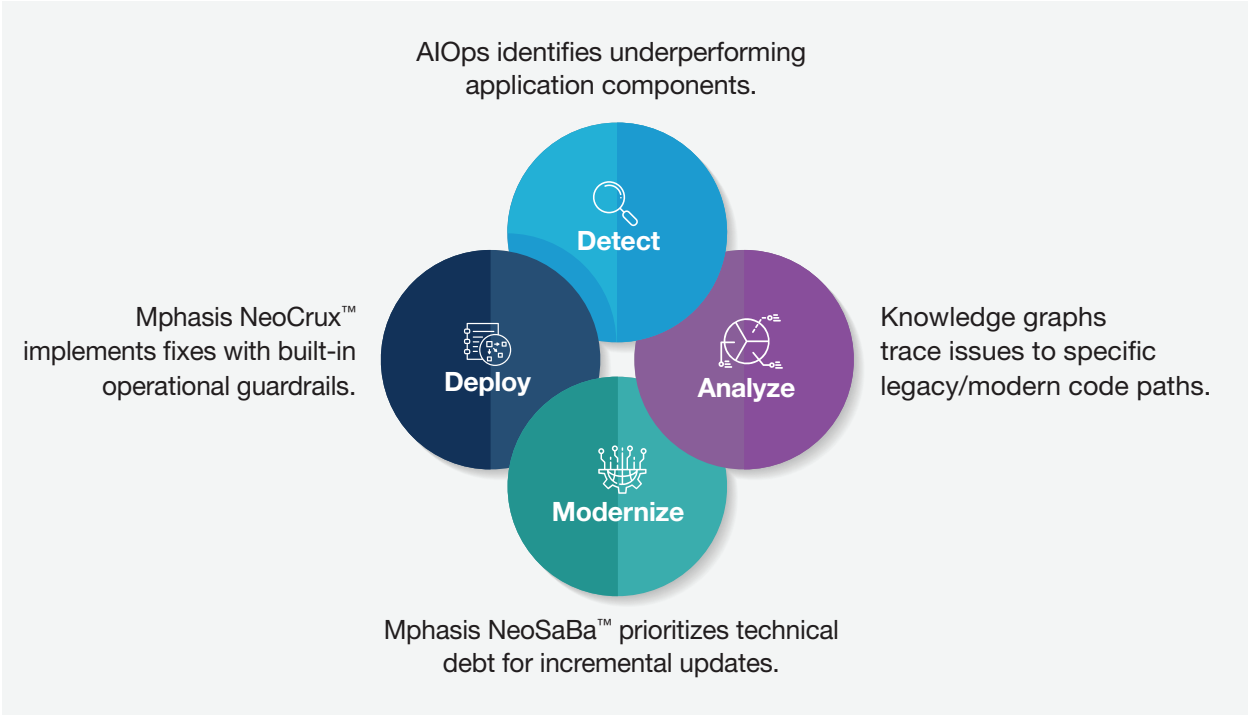
The platforms work in sequence to create self-learning application ecosystems:

Phase	Platform	AI Ops Impact
Knowledge Extraction	Mphasis NeoZeta™	Builds enterprise knowledge graphs from legacy code/docs, capturing 100% of business rules and data flows.
Requirements Engineering	Mphasis NeoSaba™	Converts graph data into executable monitoring rules and Service Level Objectives (SLOs).
Intelligent Software Development	Mphasis NeoCrux™	Embeds operational telemetry directly into new microservices via AI-generated code.

This creates a closed-loop system where:

- Mphasis NeoZeta™'s knowledge graphs inform real-time monitoring thresholds.
- Mphasis NeoCrux™ built applications stream performance data back into the graph.
- AIOps tools analyze patterns to optimize both legacy and modern systems.

The platforms create a self-reinforcing intelligence loop:



By integrating knowledge graphs with AI-driven modernization, life insurers can transform IT operations from cost centers to strategic value drivers, ensuring legacy systems actively contribute to transformation rather than hindering it.

8. The Future of Life Insurance Technology

As life insurance carriers progress on their modernization journeys, several emerging trends are shaping the technology landscape:

8.1 Composable Architecture

Future-ready life insurance platforms increasingly leverage composable architecture principles, where business capabilities are packaged as reusable modules that can be quickly assembled to create new products or services. This approach enhances business agility while reducing development costs.

8.2 Embedded Insurance

Life insurance products will increasingly be embedded into other consumer experiences, requiring flexible, API-driven architectures that can integrate seamlessly with partner platforms and ecosystems.

8.3 Hyper Automation

The combination of AI, process mining and large-scale automation enables end-to-end automation of complex business processes. For life insurers, this means opportunities to automate underwriting, claims processing, policy servicing and customer interactions at unprecedented levels.

9. Conclusion

The life insurance industry stands at a crossroad. Carriers that successfully navigate the path to modernization will gain significant competitive advantages in terms of operational efficiency, customer experience and business agility. Those that fail to address their legacy technology challenges risk falling behind more nimble competitors. By leveraging AI throughout the modernization lifecycle, life insurance carriers can:

- Preserve valuable business knowledge embedded in legacy systems.
- Improve customer experiences across all touchpoints.
- Navigate complex regulatory requirements more efficiently.
- Break down data silos to enable a unified customer view.
- Address the dual-platform dilemma with reduced risk.
- Reduce modernization costs by up to 60% and accelerate time-to-market up to 50%.

For life insurance CIOs and technology leaders, this represents a compelling opportunity to transform legacy challenges into modern capabilities without the risks associated with traditional 'rip and replace' approaches. The future of life insurance belongs to carriers that can successfully bridge their legacy knowledge with modern technology capabilities. With the right approach and tools, the path to this future is not just possible, but achievable.

About Mphasis

At Mphasis, engineering has been in our DNA since inception.

Mphasis is an AI-led, platform-driven company with human-in-the-loop intelligence, helping global enterprises modernize, infuse AI, and scale with agility. The Mphasis.ai unit and Mphasis AI-powered 'Tribes' are focused on client outcomes and embed artificial intelligence and autonomy into every layer of the enterprise technology and process stack. Mphasis built NeoIP™, a breakthrough AI platform which orchestrates a powerful pack of AI platforms and solutions to deliver impactful outcomes across the entire enterprise IT value chain, because we believe 'AI Without Intelligence Is Artificial™.' NeoIP™ is powered by the Ontosphere, a dynamic and ever-evolving knowledge base, delivering continuous and constant innovation through perpetual intelligent engineering - driving end-to-end enterprise transformation.

At the heart of our approach is customer-centricity—reflected in our proprietary Front2Back™ transformation framework, which uses the exponential power of cloud and cognitive to deliver hyper-personalized digital experiences ($C = X2C^{2}_{TM} = 1$) and build strong relationships with marquee clients. Our Service Transformation solutions enable enterprises pivot from legacy systems and operations to secure, adaptive, cloud-first operating models with minimal disruption. Continuous investments in platforms, such as the Neo series, enable enterprises to stay efficient, relevant, and ahead in a dynamic AI-first world. Mphasis is a Hi-Tech, Hi-Touch, Hi-Trust company, rooted in a learning and growth culture. Click here to know more. (BSE: 526299; NSE: MPHASIS)

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