CROSS-INDUSTRY INSIGHTS: HOW APP MODERNIZATION FUELS AI IN ECOMMERCE, INSURANCE & HEALTHCARE

Insurance, healthcare, and e-commerce companies are coming to appreciate that, in a global environment where digital experiences are becoming ever more defining, app modernization is essential.

App modernization can include artificial intelligence (AI) capabilities, which improve user experience, business efficiency, and strategic distinction. To assist companies in driving change faster, this article examines how app modernization paves the way for AI in three sectors, discovers what issues they share in common and what practices work best, and learns from experience elsewhere.

Why Update Apps Before “Doing AI”

It’s important to comprehend why app modernization is a necessary step before adopting AI, rather than just a nice-to-have update, before getting into the specifics of any given vertical.

a) Decoupling user logic from legacy monoliths

Many established organizations run on core systems written decades ago, often tightly coupled with UI, business logic, and data layers. It is challenging or dangerous to bolt AI modules onto such an architecture.

To have AI modules (e.g., orchestration and inference) seamlessly integrate, modernization often involves wrapping legacy systems with API layers or shifting functionality into microservices.

b) Supporting real-time data streams and scalability

AI applications usually require low-latency data access and scalable inference infrastructure. Old apps might batch processes on a nightly basis or rely on fixed ETL pipelines.

AI now has the ability to ingest new signals (user activities, device signals, transactional activities) and respond immediately due to contemporary apps employing event streams, message buses, or API gateways.

1. c) Architecture that is consistent and modular across domains

A common architecture approach minimizes effort duplication as AI use cases grow. For example, a document-understanding microservice or an identity/persona inference engine can serve multiple verticals. Modernization builds that share “plumbing.”

d) Governance, observability, and testability

AI needs logging, traceability, fallback paths, and monitoring for drift. Without architecture modernization, it's often impossible to inject these necessary governance controls. Modern apps include instrumentation, metric collection, versioning, and feature flags, making AI rollout safer.

Thus, modernization is not a side project; it is the foundation without which AI adoption often fails or remains fragmented and brittle.

How Modernization Powers AI in eCommerce?

eCommerce has arguably been ahead of many verticals in adopting AI, like recommendation engines, dynamic pricing, demand forecasting, and fraud detection.

But many of its successes depend on modern, composable application layers.

Typical Applications of AI in eCommerce

1) Tailored product discovery and recommendations: Based on clickstreams, past purchases, and real-time browsing signals, models determine product affinities, next best offers, bundling suggestions, and cross-sell or upsell logic.

2) Using dynamic pricing and discounts: By using AI in eCommerce, it can adjust real-time prices, check for competitor prices, and calculate price elasticity.

3) Identifying fraud and risk scoring: AI can be used to detect fraudulent behaviour in real time. This can help detect behavioral patterns, detect anomalies, and fingerprints.

4) Optimizing inventory and supply chain management: Using routing models in logistics, demand forecasting, and replenishment models helps optimize the inventory, reduce any extra waste, and avoid any stock-outs.

How Such Use Cases Are Enabled by Modernized Architecture

1) Composable inference microservices: Recommendation, pricing, and fraud-scoring models are exposed as APIs by new apps. Rather than having model logic contained within, the marketing, logistics, checkout, and storefront apps can each call a shared AI service.

2) Ingestion of live events: Stream processors keep providing the AI models with user clicks, add-to-cart actions, returns, and reviews, updating the predictions and making them relevant and current.

3) Shared data and feature store: With modernization, it is becoming possible for multiple AI services to share a central feature store (model-engineered features), avoiding redundancy and improving consistency.

4) A/B testing and feature flags: Controlled cohorts can try out new product pages, recommendation policies, or dynamic

pricing rules, roll out incrementally, or roll back. Feature flags and controlled exposure are available out of the box in apps today.

5) Edge inference/caching: In terms of performance, some of the inference would be done at the edge (CDN or mobile), but have a failback to server inference. Modernization facilitates deciding where to cache predictions and how to refresh them.

How Modernization Fuels AI in Insurance?

We discussed earlier how AI transforms claims processing. But app modernization underpins that transformation across the insurance domain. This is applicable not just to claims, but also to underwriting, distribution, and service.

Important Applications of AI in Insurance

1) Automation and triage of claims: AI models help automate document extraction, fraud scoring, damage assessment, and routing to adjusters.

2) Underwriting and risk scoring: AI leverages telematics, IoT sensors, social data, and predictive scoring models, among other sources of data, to evaluate applicant risk.

AI models are employed by usage-based or behavior-based premiums (such as pay-3) Personalization and dynamic pricing: as-you-drive) to adjust prices in real time.

4) Virtual agents and customer interaction: Chatbots and smart assistants support policy renewals, service, and claims intake.

Modernization practices that facilitate AI

1) API facade on top of legacy: Policy administration systems, claim cores, and bill engines typically cannot natively accept calls to AI. Modernization puts APIs on top of them so AI can get coverage, limits, and claim history.

2) Domain-based modularization: Insurers decompose monolithic systems into domains (claims, policies, underwriting). Each domain may have its own AI modules and services. McKinsey stresses domain-level adoption of AI to scale and drive impact.

3) Shared AI infrastructure: A document processing engine (OCR/NLP), an identity verification engine, and a fraud scoring engine can be shared between claims, underwriting, and customer service, resulting in less reinvention.

4) Decision pipeline visibility: Contemporary systems log every step of the decision process: model version used, input features, confidence score, overrides.

5) Drift detection and retraining loops: Upon data drift or performance decline, the current architecture continues training the model and initiating revalidation.

Lessons and Cross-Industry Leverage

With respect to fintech or e-commerce, insurance is often a lagging sector in digital maturity, but it can follow trends:

1. a) For fraud detection or risk scoring, share the same feature store and model-serving infrastructure as eCommerce.
2. b) Adopt feature-flag strategies, model canary deployment, and A/B testing from other sectors.
3. c) Modernized insurance apps do not have to reinvent documents using AI, but to use OCR and NLP modules for other domains.

How does Modernization help in driving AI in Healthcare?

Healthcare is considered to be one of the most complex and sensitive industries in the world. Still, AI-powered apps are slowly entering the field – especially in segments such as clinical decision support, diagnostics, and patient monitoring. For App modernization, it is important to onboard AI effectively.

AI Uses in Healthcare:

1. a) Clinical decision support & diagnosis: AI models interpret medical images, lab results, genomics, or vitals to assist with diagnosis or suggest treatment plans.
2. b) Automated documentation & summarization: Physicians use AI to record consultations, generate clinical notes, or write SOAP/BIRP notes for encounters.

3. c) Chronic care & remote monitoring apps: Patients capture vitals or wound photos via mobile, and AI models track trends or alert about deviations (e.g., wound segmentation via AI models in apps like WoundAIssist).
4. d) Administrative and operational AI: Anomaly detection and predictive scheduling models can be used in scheduling, resource allocation, reimbursement claims, and billing.

Conclusion & Forward Path

Over the next decade, app modernization will shift from being a technical upgrade to being a strategic imperative. The value of AI multiplies when it is developed on a nimble, data-dense, modular platform. Companies that refactored their applications and infrastructures in advance laid the ground for innovation in e-commerce, insurance, and healthcare.

Although AI is not a magic tool, it can help improve user experience, reduce operational costs, and redefine the value in industries.