MATH & PENCIL

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CASE STUDY #1
AUTOMATED UNDERWRITING AND CLEARANCE

OVERVIEW

Math & Pencil now has a decade of experience in the property insurance sector, our team has developed cutting-edge underwriting system software that streamlines operations for MGAs and carriers (Ventus Risk, Arch Insurance, Ping, to name a few). Our comprehensive solutions have covered the entire insurance lifecycle, from initial submission to policy management and claims processing.

Our system begins with robust submission clearance and appetite assessment tools, ensuring that only suitable risks enter your pipeline. We've perfected the art of submission ingestion, seamlessly transferring data into underwriting systems for efficient processing. Our pricing modules incorporate advanced algorithms and market data to optimize premium calculations.

A key strength of our platform is its seamless integration with catastrophe modeling tools, providing accurate risk assessment for wind, flood, and earthquake exposures. This integration allows underwriters to make informed decisions based on the latest hazard data and modeling techniques.

Policy and binder generation are automated within our system, reducing errors and accelerating turnaround times. Post-binding, our software continues to add value with features supporting claims ingestion, endorsement processing, and integration with third-party hazard data providers.

By leveraging our end-to-end solution, MGAs and carriers can significantly enhance their operational efficiency, improve risk assessment accuracy, and ultimately drive profitability in the challenging catastrophe insurance market.

SUBMISSION CLEARANCE + APPETITE ASSESSMENT

Traditionally, submission clearance in the insurance industry has been a labor-intensive process, relying heavily on teams of staff manually sifting through Outlook inboxes, opening emails, and determining whether an MGA or carrier can underwrite a particular risk. This approach is not only time-consuming but also prone to inconsistencies and human error.

Our team has leveraged years of experience to develop an advanced, algorithmic-based clearance system specifically designed for property insurance (and adaptable to other lines of business). This innovative solution utilizes Natural Language Processing (NLP) and other sophisticated heuristics to revolutionize the clearance process.

Key features of our algorithmic clearance system include:

1. Automated parsing of crucial information from email bodies, including insured names and relevant dates.
2. Intelligent ACORD form and Schedule of Values (SOV) interpretation.
3. Integration with third-party data sources for automatic checks, such as OFAC screening.

The impact of our system is transformative:

- Time Efficiency: We decrease the time required for clearance on a per-submission basis by an order of magnitude.
- Cost Savings: By significantly reducing the size of your clearance staff, we help cut operational costs.
- Consistency: Our algorithms ensure uniform application of clearance criteria across all submissions.
- Accuracy: By minimizing human intervention, we reduce the risk of oversight or error.

Our approach lets the algorithms do the heavy lifting in filtering submissions, allowing your underwriting team to focus on more complex decision-making and value-added tasks. This not only speeds up the clearance process but also enhances the quality of risk selection from the outset.

By implementing our algorithmic clearance system, MGAs and carriers can process a higher volume of submissions more efficiently, respond to brokers faster, and ultimately write more business while maintaining strict adherence to their risk appetite.

SUBMISSION INGESTION + UNDERWRITING SYSTEMS

Our team brings years of specialized experience in designing and implementing integrations that seamlessly connect cleared submissions with existing underwriting systems. This expertise spans a wide range of solutions, accommodating both off-the-shelf SaaS-based platforms and custom-developed internal systems.

Key aspects of our integration capabilities include:

1. Flexible Integration Architecture: Our solutions are designed to work with various underwriting system types, ensuring compatibility regardless of whether you're using a commercial SaaS product or a proprietary in-house system.
2. Data Mapping and Transformation: We create robust data mapping processes to ensure that information from cleared submissions is correctly formatted and aligned with the target underwriting system's requirements.
3. API Development and Management: For systems that support it, we develop and maintain APIs that allow for real-time data transfer between the clearance process and the underwriting platform.
4. Legacy System Integration: We have extensive experience in creating bridges between modern clearance tools and older, legacy underwriting systems that may lack native integration capabilities.
5. Automated Workflow Triggers: Our integrations can initiate specific workflows within the underwriting system based on submission characteristics, streamlining the process further.
6. Data Integrity and Security: All our integrations are built with a focus on maintaining data integrity and security throughout the transfer process.
7. Scalable Solutions: Our integration designs are scalable, capable of handling increasing volumes of submissions as your business grows.

8. Customization and Tailoring: We work closely with clients to understand their specific underwriting processes and tailor the integration to match their unique workflows and requirements.

By leveraging our expertise in this area, MGAs and carriers can:
- Eliminate manual data re-entry between systems
- Reduce processing time for new submissions
- Minimize errors associated with manual data transfer
- Ensure consistency in how submissions are presented to underwriters
- Improve overall operational efficiency in the underwriting process

Our team's deep understanding of both clearance processes and various underwriting systems allows us to create seamless, efficient integrations that significantly enhance the speed and accuracy of submission processing, ultimately supporting more informed underwriting decisions and faster response times to brokers and clients.

PRICING AND PREMIUM CALCULATION

Our team brings extensive experience in collaborating with underwriters and actuaries to develop sophisticated, customized All Other Perils (AOP) models. These models form the backbone of accurate pricing and premium calculation in property insurance, particularly for risks not covered by standard catastrophe models.

Key features of our AOP modeling and pricing solutions include:
1. Customized Model Development: We work closely with your underwriting and actuarial teams to create AOP models that precisely reflect your risk assessment methodology and pricing strategy.
2. Flexible Hosting Options: Our AOP models can be hosted internally within your infrastructure or made available via API, providing flexibility to suit your IT preferences and capabilities.

3. Dynamic Parameter Updates: Users can modify model parameters in real-time, allowing for quick adjustments to pricing strategies in response to market conditions or new data insights.

4. Comprehensive Audit Trail: Our system maintains a detailed history of all changes made to the model, including what was changed, when, and why. This feature supports regulatory compliance and enables retrospective analysis of pricing decisions.

5. Version Control: Multiple versions of the model can be maintained, allowing for A/B testing of different pricing strategies or easy rollback if needed.

6. Integration with Existing Systems: Our AOP models can be seamlessly integrated with your existing underwriting and policy management systems for streamlined operations.

7. Data-Driven Insights: The models incorporate various data sources to provide more accurate risk assessment and pricing.

8. Scalability: Our solutions are designed to handle a growing volume of pricing calculations as your business expands.

Benefits of our custom AOP modeling and pricing solution:

- Enhanced Pricing Accuracy: Tailor your pricing to specific risk characteristics that standard models might not capture.
- Increased Agility: Quickly adapt to market changes by updating model parameters in real-time.
- Improved Compliance: Maintain a clear audit trail of all pricing decisions and model changes.
- Better Risk Selection: More accurate pricing leads to better risk selection and portfolio management.
- Competitive Advantage: Customize your pricing approach to differentiate your offerings in the market.

By leveraging our expertise in developing custom AOP models, MGAs and carriers can enhance their pricing sophistication, improve risk assessment accuracy, and maintain a competitive edge in the dynamic property insurance market. Our solution empowers underwriters with the tools

they need to make data-driven pricing decisions while providing the flexibility to adapt quickly to changing market conditions.

CATASTROPHE MODELING INTEGRATION

Our team brings extensive experience in providing seamless integrations with industry-leading catastrophe models, significantly enhancing the efficiency and accuracy of risk assessment for property insurance.

Key features of our catastrophe modeling integration include:

1. Comprehensive Model Coverage: We offer robust API integrations with major catastrophe modeling platforms, including:

  - Verisk AIR
  - Moody's RMS
  - KCC (Karen Clark & Company)

2. Flexible Deployment Options: Our solutions support both on-premises implementations and integrations with cloud-based SaaS versions of these models, providing flexibility to match your IT infrastructure and preferences.

3. Real-Time Parameter Adjustments: Underwriters can modify key parameters affecting Average Annual Losses (AALs) directly within our software interface, enabling quick remodeling without the need for external data entry teams.

4. Automated Data Transfer: Our system eliminates the need to manually send Aggregate Condition Code (ACC) and Location (LOC) files to offshore data entry teams, significantly reducing processing time and potential for errors.

5. Instant Remodeling: Changes in parameters or risk data trigger immediate remodeling, with results quickly returned to the underwriter's dashboard.

6. Version Control and Audit Trail: All modeling runs are logged with their respective parameters, supporting compliance requirements and allowing for retrospective analysis.

7. Multi-Model Comparison: Our platform can run scenarios across different cat models simultaneously, enabling easy comparison of results.

Benefits of our catastrophe modeling integration:

- Accelerated Quoting Process: By eliminating manual data transfers and enabling instant remodeling, we speed up the quoting process by an order of magnitude.
- Enhanced Competitiveness: Faster quote turnaround times give our clients a significant edge in the market.
- Improved Accuracy: Direct integration reduces the risk of data transfer errors, ensuring more reliable model outputs.
- Empowered Underwriters: With the ability to adjust parameters and instantly see results, underwriters can make more informed decisions quickly.
- Operational Efficiency: Reduce reliance on offshore data entry teams, streamlining operations and reducing costs.
- Consistency Across Models: Our standardized interface for different cat models ensures consistency in how underwriters interact with and interpret results from various platforms.

By leveraging our catastrophe modeling integration, MGAs and carriers can dramatically improve their risk assessment capabilities, reduce quote turnaround times, and make more informed underwriting decisions. This technological edge translates directly into improved competitiveness in the property insurance market, particularly in catastrophe-prone areas where accurate risk assessment is critical.

QUOTE, BINDER, AND POLICY GENERATION

Our team has developed sophisticated systems that automate the creation of critical insurance documents, significantly improving efficiency and accuracy in the policy issuance process.

Key features of our policy and binder generation system include:

1. Automated Document Creation: Our system generates quotes, binders, and policy documents automatically using data stored in the database, eliminating the need for manual cut-and-paste operations from system to Word documents.
2. Template Customization: We offer flexible document templates that can be tailored to match your specific branding and regulatory requirements.
3. Dynamic Data Population: The system pulls relevant information from various database fields to populate documents accurately and consistently.
4. Multi-Document Workflow: Our solution can generate multiple related documents (e.g., quote, binder, and policy) in a single workflow, ensuring consistency across all paperwork.
5. Version Control: The system maintains a history of document versions, allowing for easy tracking of changes and revisions.
6. Integration with Underwriting Systems: Seamless integration with your existing underwriting platforms ensures that the most up-to-date information is always used in document generation.
7. Digital Signature Integration: Support for digital signature technologies to streamline the document finalization process.
8. Audit Trail: Comprehensive logging of document generation activities for compliance and quality control purposes.

Benefits of our policy and binder generation system:

- Increased Efficiency: Dramatically reduce the time required to produce quotes, binders, and policies.
- Enhanced Accuracy: Eliminate errors associated with manual data entry and copy-pasting.
- Consistency: Ensure all documents follow standardized formats and contain consistent information.
- Improved Compliance: Automated generation helps ensure that all required clauses and disclosures are included in every document.
- Faster Turnaround: Quicken the entire policy issuance process, improving customer satisfaction and potentially increasing business volume.
- Resource Optimization: Free up staff from tedious document preparation tasks, allowing them to focus on more value-added activities.

- Scalability: Easily handle increased document generation demands as your business grows.

By implementing our automated policy and binder generation system, MGAs and carriers can significantly streamline their operations, reduce errors, and accelerate the policy issuance process. This not only improves internal efficiency but also enhances the experience for brokers and policyholders, potentially leading to increased business and improved customer retention.

CLAIMS MANAGEMENT

Our team has extensive experience in developing robust systems for claims data ingestion, particularly from industry-leading claims management platforms such as Majesco and other prominent providers. This expertise allows us to seamlessly integrate claims data into your underwriting and risk management processes.

Key features of our claims data ingestion system include:

1. Multi-Platform Integration: We've developed flexible connectors that can ingest claims data from various sources, including Majesco and other major claims management systems used in the insurance industry.
2. Automated Data Extraction: Our system can automatically pull claims data at scheduled intervals or in real-time, ensuring your databases are always up-to-date with the latest claims information.
3. Data Normalization: We transform and standardize claims data from different sources into a consistent format, making it easier to analyze and use across your organization.
4. Data Validation and Cleaning: Our ingestion process includes robust data validation checks to ensure the accuracy and completeness of incoming claims data.
5. Historical Data Migration: We can assist in migrating historical claims data from legacy systems, providing a comprehensive view of claims history.
6. Scalable Architecture: Our solution is designed to handle large volumes of claims data, scaling effortlessly as your business grows.
7. Secure Data Handling: We implement stringent security measures to protect sensitive claims information throughout the ingestion and storage process.

8. Customizable Mapping: Our system allows for customizable field mapping, ensuring that ingested data aligns perfectly with your existing database structure.

Benefits of our claims data ingestion system:

- Improved Risk Assessment: Access to up-to-date claims data allows for more accurate risk profiling and underwriting decisions.
- Enhanced Reporting: Consolidated claims data from multiple sources enables more comprehensive and insightful reporting.
- Operational Efficiency: Automated ingestion reduces manual data entry, saving time and reducing errors.
- Better Decision Making: Quick access to claims history supports informed decision-making in underwriting and policy renewals.
- Fraud Detection: Comprehensive claims data can help in identifying patterns that may indicate fraudulent activities.
- Regulatory Compliance: Ensures that all relevant claims data is captured and stored in compliance with regulatory requirements.

By leveraging our expertise in claims data ingestion, MGAs and carriers can gain a more holistic view of their risk landscape. This integration of claims data into your broader insurance operations ecosystem supports more informed underwriting, enhances risk management strategies, and ultimately contributes to improved profitability and customer satisfaction.

THIRD-PARTY HAZARD INTEGRATIONS

Our team boasts comprehensive experience in integrating a wide array of third-party data providers crucial to the property insurance space. This expertise allows us to offer a rich, multifaceted view of property risks by leveraging the most up-to-date and accurate external data sources.

Key features of our third-party hazard integrations include:

1. Comprehensive Provider Coverage: We have established integrations with all major data providers in the property insurance industry, including but not limited to:

     I.   MSB (Marshall & Swift/Boeckh)

     II.   HazardHub

     III.   Various geocoding providers

     IV.   E2Value

     V.   Nearmap

     VI.   Tensorflight

     VII.   Cape Analytics

     VIII.   BuildFax

     IX.   Verisk

     X.   Prometrix

     XI.   And many more

2. Seamless Data Incorporation: Our system efficiently pulls and integrates relevant data from these providers into your underwriting workflow, enriching your risk assessment process.

3. Real-Time Data Fetching: We offer both batch processing and real-time data retrieval options to suit your operational needs.

4. Normalized Data Presentation: Data from various sources is standardized and presented in a consistent format, facilitating easy comparison and analysis.

5. Configurable Integration: Our flexible system allows you to easily add, remove, or modify third-party data sources as your needs evolve.

6. Cost Optimization: Our integrations are designed to optimize API calls and data usage, helping to manage costs associated with third-party data services.

7. Data Quality Assurance: We implement checks to ensure the quality and consistency of data received from third-party providers.

8. Audit Trail: All third-party data requests and responses are logged for compliance and quality control purposes.

Benefits of our third-party hazard integrations:

- Enhanced Risk Assessment: Access to a wide range of specialized data sources allows for more accurate and comprehensive risk evaluation.

- Improved Underwriting Decisions: Enriched property data leads to better-informed underwriting choices and more precise pricing.

- Operational Efficiency: Automated data retrieval from multiple sources saves time and reduces manual research efforts.
- Competitive Advantage: Leveraging cutting-edge data sources can provide insights that set you apart in the market.
- Fraud Detection: Cross-referencing data from multiple sources can help identify discrepancies and potential fraud.
- Customizable Risk View: The ability to combine data from various providers allows for a tailored approach to risk assessment based on your specific underwriting guidelines.

By utilizing our extensive third-party hazard integrations, MGAs and carriers can significantly enhance their property risk assessment capabilities. This comprehensive approach to data integration supports more accurate underwriting, improved risk selection, and ultimately, a stronger, more profitable portfolio in the competitive property insurance market.

IN CLOSING

Whew. That was a lot. It took a few years to get all that software together and flowing but was a fascinating project with an immense amount of depth, moving parts, personnel, and fun problem solving. The best part for us... and maybe you... that knowledge and experience gleaned allows us to quickly digest similar insurance problems and offer industry leading consultancy services and solutions at both large and small scales.

Reach out at info@mathandpencil.com to talk.