REVISUALIZING UNDERWRITING – PART I

BLENDING HUMAN JUDGEMENT WITH DATA-DRIVEN INSIGHTS

Abstract

Most insurance carriers struggle to identify quality submissions due to inefficient processes, which leads to underwriter fatigue and poor relationships with brokers and customers. This paper — the first in a two-paper series — details how current submissions processes can be completely overhauled using prescriptive analytics and workflow tools to deliver a plethora of business benefits.

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Inefficiencies leading to poor outcomes

In underwriting, the submission process is tedious, time consuming, complex, and unstructured. In addition, underwriters need to key-in similar sets of data across disparate applications while binding the quotes. The fatigue this causes often leads them to selectively fill-in data into the underlying system of records, and that too only for the submissions they decide to quote for. These inefficiencies lead to several poor outcomes.

First, actuarial analysis is often flawed due to data inadequacy and carriers face opportunity loss due to a lack of visibility on what to quote for. Thus, quote and bound ratios remain poor, where the quote ratio = total quotes/total submissions, and the bound ratio = total bound/total submission. Also, there is significant loss of time and effort especially on unbound quotes.

Moreover, the high dependency on manual processes and lack of mechanisms to handle seasonal spikes result in a high reliance on human judgement while prioritizing quotes. This requires multiple iterations of reviewing documents that leads not only to underwriter fatigue but also to strained relationships between brokers and underwriters.

Overhauling submissions

Because the challenges involved in the submission to binding process are cyclical, a solution to prioritize submissions can help resolve them. This requires completely overhauling the business processes involved, through leveraging cutting-edge machine learning models, visualization, and workflow tools.
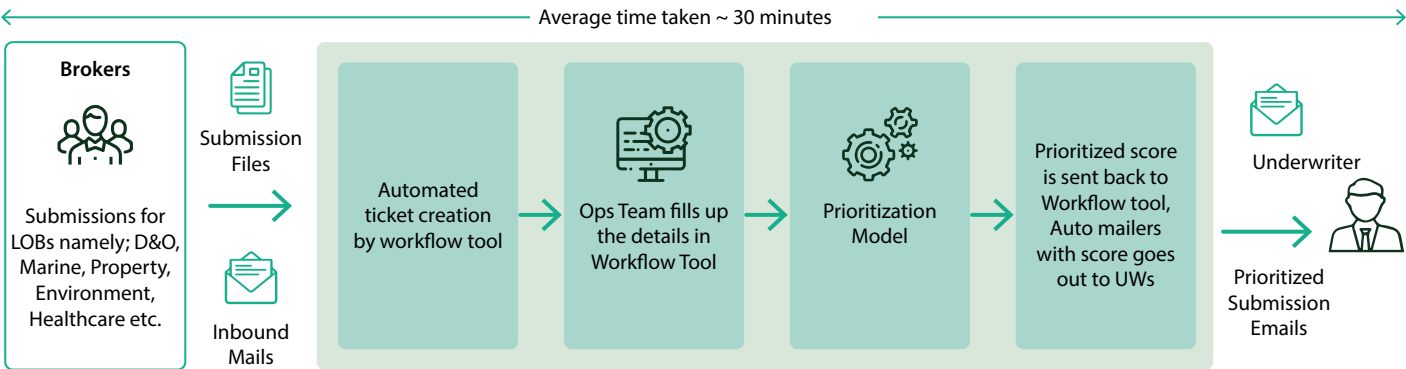
One such potential solution as, depicted here, reimagines the submission process flowing through the components detailed below:

- Workflow tool: The workflow tool automatically converts inbound mails into workflow tickets. Later in the flow, it also receives prioritization scores from the prioritization engine and communicates them to the underwriters

- Dedicated operations team: This team captures the key parameters from the submission documents and adds them to the workflow ticket as well as other system of records. A flat file containing these key parameters are fed into the prioritization model

- Prioritization engine: The prioritization engine uses state-of-the-art mathematical and statistical models to determine the submission quality and priority index of each workflow ticket, using the key parameters captured by the operations teams. The engine sends the scores to the workflow tool which then communicates them to the specific underwriters to whom the submissions are assigned. The underwriters are thus enabled for better and faster decision making

- Diagnostic monitoring dashboard: The dashboard provides continuous insight on the prioritization model performance as well as actionable business insights such as underwriter submission load, quality of submissions received by regions, by brokers, and the like.

Mechanisms of the prioritization engine

Historically, data-driven analytical approaches have their limitations when it comes to providing precise predictive solutions. This is because certain driving factors such as human judgement and preferences in underwriting cannot be quantified. Yet, it has been observed that tools using such approaches can used with good effect in supplementing human judgement. Hence, the solution would be to approach the problem through a hybrid analytical approach which considers and ranks the variable preferences of the underwriters in tandem with historical data.

Hybrid Model = Parameters ranking by UW preference + Parameter sub weights derived from ML models

Rank 1: Parameter 1	Rank 2: Parameter 2	Rank 3: Parameter 3
	Rank 4: Parameter 4	Rank 5: Parameter 5
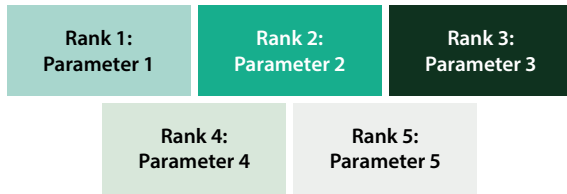
Parameter 1:
Sub Parameter 1.1
Sub Parameter 1.2
Sub Parameter 1.3
Sub Parameter 1.4

Parameter 2:
Sub Parameter 2.1
Sub Parameter 2.2
Sub Parameter 2.3
Sub Parameter 2.4
Sub Parameter 2.5

Parameter 3:
Sub Parameter 3.1
Sub Parameter 3.2
Sub Parameter 3.3

The ranking of parameters to be defined with extensive discussion with UW based on their submission preference

These sub parameter weights are derived from analyzing historical data and running multiple ML models

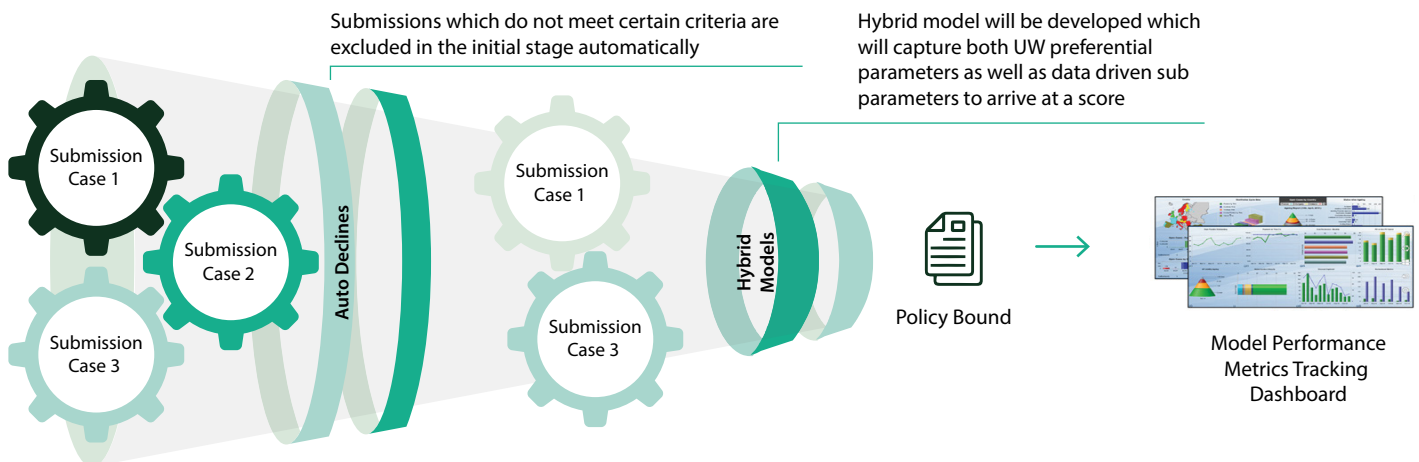The hybrid model can consist of two sub-models mainly:

- Macro-variable weighted model: This part of the model uses several rank ordering mechanisms to perfectly capture an underwriter's preference while writing a submission.

- Micro-variable weighted model: This part of the model is completely data-driven. Machine learning models such as logistic regression, decision trees, and random forest can be developed to get more optimized, stable weights for the parameters.

The scores generated from the above two models can be normalized and combined to form a single score for each submission. Thus, state-of-the-art mathematical models like Random Forest or SG Boost can be built to capture data-driven weights from historical data, along with underwriters' experience through iterative discussions and validation processes.

The overall model process flow can be visualized as below

Submissions which do not meet certain criteria are excluded in the initial stage automatically

Hybrid model will be developed which will capture both UW preferential parameters as well as data driven sub parameters to arrive at a score

At first, each submission passes through a business rule layer where unwanted submissions which are not underwritten due to certain business concerns are removed. Then, the filtered submissions are processed by the hybrid models where submission scores are generated. These scores are then bucketed for easy understanding and standardization, for example through assigning ranks such as top priority, next-best, potential, or low priority.

Once the prioritization engine has processed the submissions, it outputs the scores to the workflow tool. Next, it emails with the scores, category buckets, and highlights the reason for the score. The underwriters can now decide on which submissions to act on with their priority based on the scores received, instead of working through all the submissions received.

A plethora of potential benefits

The solution's intangible benefits include improving the underwriters' quality of work and thus enhancing work satisfaction as well. It can also help improve the quality of engagement between brokers and underwriters, where underwriters can visit the brokers with specific inputs on their preferences and sustain a mutually symbiotic relationship. Eventually, once the quality of submissions received improves, the overall revenue and top line will also improve further. In a nutshell, the solution has great potential to optimize submission processes towards helping underwriters focus on actual decision making and relationship building with brokers and customer.

About Author
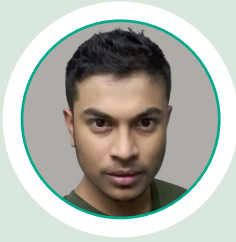
Spandan Mitra
Senior Lead Analyst, Digital Transformation Services, Infosys BPM

Spandan is a Senior Lead Analyst with Infosys BPM's Digital Transformation Services and is responsible for Analytics – digital solution design and service delivery. He has over 8 years of experience across designing, developing and implementing analytical solutions to help solve problems for businesses and deliver value. He has worked on several projects which includes state of the art algorithms in R & Python. Before joining Infosys BPM, Spandan has worked for companies like TCS, WNS, HSBC, & Prudential.

Sourav Ghosh
Senior Industry Principal, Infosys BPM

Sourav is a Senior Industry Principal with Infosys BPM's Digital Transformation Services, and is responsible for Financial Services & Insurance – Digital solution design and service delivery. An IBM-certified design thinking practitioner, he advises organizations on their operations strategy, assists them in improving profitability and efficiency of business processes, and helps in executing business transformation through calibration of operating model and technology.

Prior to Infosys BPM, Sourav had been with IBM, Satyam, Tata Consultancy Services and Standard Chartered Bank in diverse roles across India, US, and UK.

For more information, contact infosysbpm@infosys.com

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