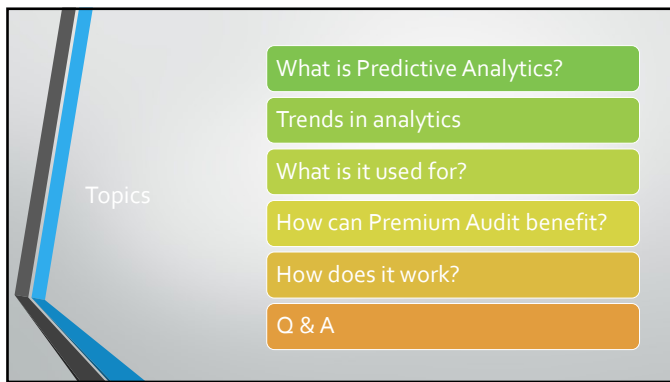
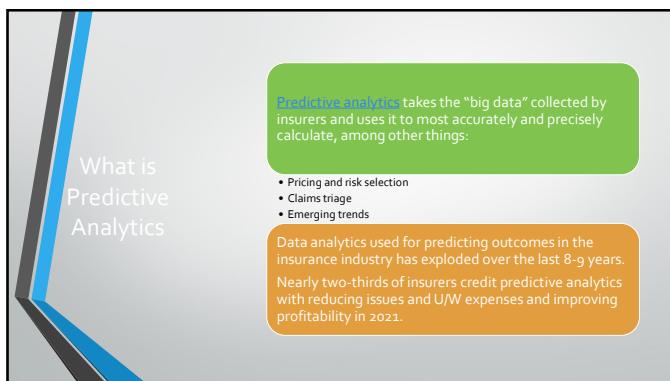




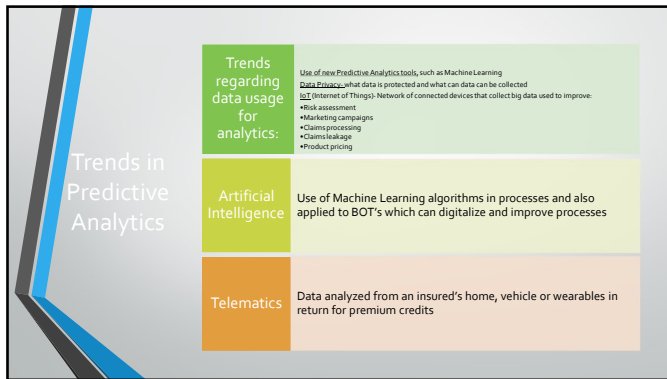
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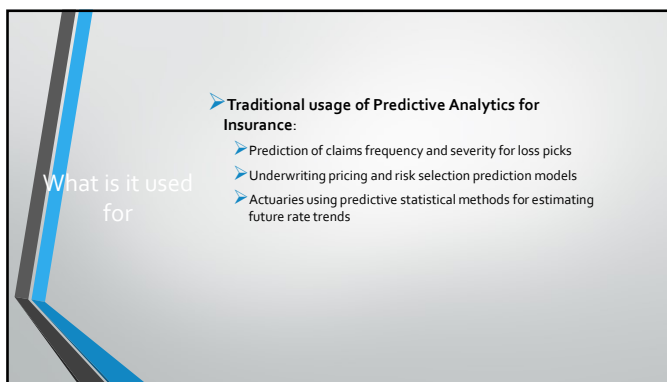
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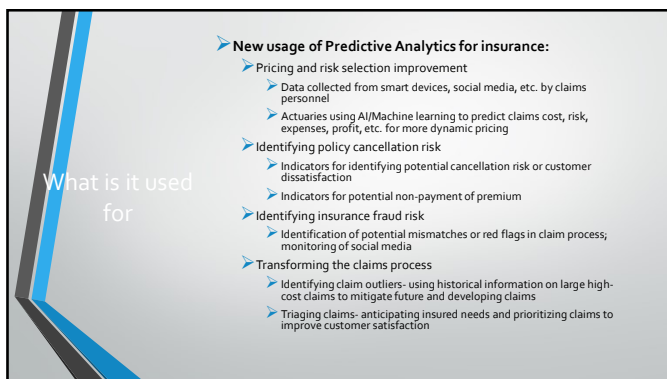
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6

What is it used for

- **New usage of Predictive Analytics for insurance (con't)**
 - Anticipating trends
 - Assist in planning new products, customer experience, new technology, etc.
 - Identifying potential markets
 - Behavior patterns through social media can help with this
 - Agent interactions
 - Helping to better predict future performance with various agents' book of business and also identify application manipulation
 - Focusing on customer loyalty (VOC)
 - Becoming more important for customer retention
 - Providing a personalized experience
 - Through use of apps, etc. making processes easier for insureds
 - Using "What-if" modeling
 - Helps to evaluate and predict the impact of change on an insurer's book of business (such as with Covid-19)

7

Other Business Uses for Analytics

- Enterprise Planning with Analytics Cloud Software
 - "Agile" environment coordination of Sales, Finance and Operating budgets plans
 - Data Driven decisions using machine learning predictive analytics

8

Sports Analytics

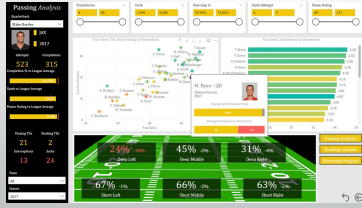
- "Moneyball" 2002 Oakland Athletics baseball team used "Sabermetrics" to enhance player acquisition with limited budget and make the playoffs



9

Sports Analytics

- The NFL - the Philadelphia Eagles employed Data-driven analytics strategies and aggressive decision making which was part of the reason the Eagles won Super Bowl LII in the 2017 season.



10

What About Premium Audit?

- How can predictive analytics be used in the Premium Audit environment?
 - Audit type selection
 - Audit Quality Assurance

11

How can Premium Audit benefit

Premium Audit Selection Type

- Predicting Audit Product type can assist customer with their ROI
- Audit selection predictions are compared to net AP/RP predictions by policy to determine the best possible ROI scenario
- Carriers can then use this for budgeting purposes or to support certain budget projections based on predicted ROI
- The process can be automated to feed directly from a customer's audit ordering system to the predictive tool and then into the audit inventory
- Reports are generated quarterly and provided to the carrier to compare predicted results to prior ordering patterns
- Carriers can then make future decisions based upon improved ROI results

12

How does it work

➤ **The Process**

- De-identification and extraction of historical "Big-Data" queried from a secure data warehouse
- Raw data is promulgated into columns based upon selected parameters of exposure and classifications
- A multitude of variables are then created and applied to the data and the fun begins...

13

How does it work

- Various rule algorithms and variable ranges are then created by industry type and exposure levels
- Additional Macro Economic and State Statutory data is inserted and applied to policy geography
- The historical information from the database is then promulgated into the above rules and then compared to policy data to make a prediction of potential misexposure and misclassification
- Testing is applied to continue to refine results and improve accuracy
- Machine Learning Algorithms are then developed which when applied compare actual results to historical predictions. The algorithms continue to "learn" from this process, improving prediction accuracy

14

Prediction Result

- Prior year overall policy estimates and actual exposure variances are compared to current year policy estimates
 - Current year exposure projection is then made by comparing to prior year trend, rules based algorithms and macroeconomic data
- Prior year policy exposure shifts between class codes are compared to current year policy estimates
 - Current year misclassification projection is then made by comparing to prior year trend, rules based algorithms and all the other class codes from similar policies in the database

15

Prediction Result

- These results by policy are then "bucketed" into categories of degree of predicted misclassification and misexposure
- This will then determine the proper audit product line to be applied to the given policy that will provide the best ROI
- Reporting can be provided to compare actual predicted results vs. how the policies were ordered, providing an overall ROI

16

ROI Result

# of Policies	Qtr 12 Before	After	Net AP/RP Before	Net AP/RP After	Audit Cost Before	Audit Cost After	ROI Before	ROI After	\$ Increase
Physical	200	200	\$4,000	\$4,800	\$40,000	\$40,000	10.0%	12.0%	\$800
Remote-Physical	300	185	\$4,500	\$4,845	\$52,500	\$49,875	8.6%	9.7%	\$2,625
Verified Phone	150	185	\$900	\$1,565	\$12,000	\$18,000	6.0%	9.0%	(\$1,735)
Phone	250	240	\$750	\$80	\$12,000	\$12,000	6.0%	7.0%	\$590
Voluntary(Mail)	300	290	\$500	\$715	\$10,000	\$10,000	5.7%	7.1%	\$475
Total	1200	1200	\$10,750	\$12,875	\$135,500	\$130,575	8.2%	9.9%	\$2,100
ROI= Net AP-RP/ Total Audit Cost									
Ave cost	\$300	\$125	\$100	\$50	\$15				
Ave Net AP-RP*- Previous	\$ 30.00	\$ 15.00	\$ 6.00	\$ 3.00	\$ 2.00				
Ave Net AP-RP*- Predicted Actual	\$ 24.00	\$ 17.00	\$ 9.00	\$ 3.50	\$ 2.50				
* Calculated based on Manual Premium	Physical	Remote-Physical	Verified Phone	Phone	Voluntary(Mail)				

17

ROI Result

- Because policies get bucketed into the correct audit product line:
- Improves ROI % per product line
- Improves overall \$ return

18

Trends for Premium Audit

- Industries Poised for a Comeback from last two years:
 - Dry Cleaning Industry- more workers now going back into the office
 - Perhaps not at pre-pandemic levels but improved from prior two years
 - Clothing Manufacturing- as more people return to offices
 - Restaurants and Bars
 - Entertainment Industry- Theatres, Concert Halls, Stadiums, Indoor Amusement Parks, etc.
 - Travel and Hospitality- Airlines, Bus Companies, Passenger Trains, Hotel/Motels, Cruise lines, Rental cars, Amusement Parks, etc.
 - Janitorial services- more offices opening
 - Sanitation services
 - Manufacturers and distributors of filtration systems for schools, airlines, office complexes, etc.
 - Construction? Recent survey by CoConstruct stated 55% of residential contractors anticipate doing more business this year (2022)- more in remodeling. Also anticipating supply-chain issues will hopefully improve.

19

Trends for Premium Audit

- Additional macroeconomic factors can be specifically built into the analytics model to recognize the trends for the above mentioned industries
- Analytics model will compare current policy estimates with prior year audits
 - Can determine trends developed for potential misexposure by applying trends for the below factors by industry type and zip code:
 - Unemployment %
 - CPI
 - Wage growth %

20

Trends for Premium Audit

- **Remote-Physical Audits vs. Physical Audits**
 - Use previously mentioned macroeconomic data to help identify trends by industry
 - Look for renewal policies where variance in prior year audited exposure to current year estimates are negligible- good candidate for remote-physical vs. physical
 - Compare exposure variances between current policy estimates and actual audited exposures for previously audited policies
 - Compare exposure shifts between certain class codes of current policy estimates to previously audited policies
 - Then compare this data to historical and current year policy estimates for similar policies and make projections.
 - Also compare exposure and classification variances for policies audited as remote-physicals during 2020 and 2021 to prior years and current estimates to help make projections.

21

Trends for Premium Audit

➤ Remote-Physical Audits vs. Physical Audits

- Other factors to consider:
 - Geography and expense to reach certain areas- Is there a benefit to a physical audit if there has been no history of issues with a renewal account and its not a rebounding industry?
 - Prediction will most likely be a remote-physical on renewal policies with no history of major exposure or classification deviations.
 - Predictions can get granular enough to predict the ROI on each policy to assist with this determination

22

How can
Premium Audit
benefit

Quality Control/Review Process

- Data from the previous process can be applied to audits and policies as they enter the Quality review process
- Policy and audit complexity can be determined from various parameters
- Magnitude of material items can also be determined
- Level of auditor experience is also applied
- The audit will receive a complexity score based on the above and be bucketed accordingly
- Degree of quality review can then be properly aligned
- Audits are then scored for quality in the review process for performance purposes

23

How can
Premium Audit
benefit

Example:

- Utilize a multi-pronged approach that can be built into the quality queue of the inventory management system
 - Policy misclass and misexposure actual results from audit compared to estimates
 - Percentage of actual exposure variance
 - Percentage of actual shift in exposure between class codes
 - Policy complexity
 - Number of class codes, type of class codes
 - Size of exposure
 - Auditor experience level
- The above three parameters are scored and then a combined score is determined
 - Cases can then be assigned into buckets by complexity
 - Red flags can be built in
 - Low complexity policies with no red flags may qualify for random review

24

What should I do?

- Find out where your audit results data is being stored
- Obtain the "Big data" in an Excel queried format from your company's database
- Sort and pivot the data and look for trends
- Create rules to identify specific trends
- Discuss with management and submit a cost benefit analysis for IT resource
- Share your goal with IT resource and have them assist with building a rudimentary tool for you.
- Or, look for companies that have these tools in the marketplace

25

Q & A

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26
