Insurance fraud analytics
Information is now stored almost exclusively electronically, therefore organisations must develop increasingly specific competencies in line with the development of technology. Less advanced IT systems are unable to deal with critical situations and incidents that create an immediate need for data to be analysed, produced and preserved.

How can we help to identify irregularities?

**Data analytics:** Increased ease, timeliness & reliability for future queries & analysis

**Insightful visualisation:** Customised dashboards for investigation team & management to draw insights into data

**E-discovery:** Analysis of unstructured data, such as emails, office documents, photographic images, audio recordings etc.

**Internal investigations:** Substantiate allegations made against competitors or employees through the analysis of electronic communications and other data

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**Manage data**
Collecting, consolidating and cleaning relevant data

**Perform analytics**
Applying intelligent techniques to uncover insight from the relevant data

**Create visualisation**
Converting the data into a more comprehensible and user-friendly format

**Harness insights**
Applying insights into more effective decision-making

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**Underpinned by PwC’s industry expertise and experience**

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Has a regulator requested that you produce electronic information in connection with a controversy?

Do you need to investigate fraud suspicions and wrongful behaviour related to an employee’s activity or to intellectual property infringements?

Do you need to analyse complex data to investigate potential fraud or other problems?
What fraud analytics can we deliver for insurance companies?

- **Claims analytics**
  Details of client, contract, claim details and claims processing stage

- **Underwriting analytics**
  Demographic, Psychographic and behavior details of applicants for rating and scoring

- **Leaves/opportunity analytics**
  Opportunity details across campaigns, branches and unit managers

- **Contact centre analytics**
  Inbound, outbound, type of call, status, result, SMS campaign details

- **Management dashboard**
  Top management and Departmental Dashboards along with strategy linkages and initiative tracking

- **Premium analytics**
  First Year Premium, Renewal Premium

- **Distributor analytics**
  WRP, WFP, commissions across Channels and Cannel types, time period, geography, policy, actual/budget and expense category

- **Customer analytics**
  Top policy holders across time period, geography, channels, products and policies

- **P&L, pricing and profitability**
  Incomes, expenses and overheads across periods, policies, geography and channels by actual and targets

- **Fraud analytics**
  Identification of fraudulent transaction patterns and fraud rings

How is our methodology and role for fraud identification?

**Iterative sprint approach of machine learning for fraud identification**

1. **Define scope & combine data for analysis**
2. **Define scope & combine data for analysis**
3. **Define scope & combine data for analysis**
4. **Define scope & combine data for analysis**
5. **Define scope & combine data for analysis**

**Split can be made in several ways and at different process steps:**
- Randomised after clustering (‘unsupervised’)
- Based on variation of clusters after clustering (‘supervised’)
- Based on a certain characteristic as identified through the rule based detection

**5-step approach in each iteration. After each iteration, we will then re-assess the results and improve the algorithm**

1. **Data pre-processing**
   Perform pre-computation to aggregate the data for better performance
2. **Self organisasing maps (SOM) analysis**
   Apply an artificial neural network combined with hierarchical clustering to spot and interact with local correlations
3. **Cluster analysis**
   Identify data points that do not fit in any cluster well and flag the anomalies for further analysis
4. **Anomaly clustering**
   Identify anomalies clusters based on similarity which may then point to a previously undetected pattern or fraud
5. **Validation of results**
   Compare to scenarios and investigate for possible fraud. Then improve existing rules and form new rules for more accurate detection
**What fraud analytics can we provide to insurance companies?**

Provide an interactive visualisation of the performance of life and general insurance business based on key metrics:
- Commission ratio
- Expense ratio
- Loss ratio
- Lapse ratio
- Solvency ratio
- Combined ratio
- Profit
- Premium actual vs budget
- New & renewal policies

Assessment on claims to highlight suspicious claims indicative of fraudulent activities, such as:
- Claims made just before policy maturity or effectivity of the policy
- Multiple claims for 1 policy holder
- Multiple claims incident occurring within x days intervals
- Report or register delays after incident or in different years

Monitoring of agency performance and risk indicators to ascertain whether there are any patterns of behavior of insurance agents that could potentially be indicative of manipulation of the company’s incentive and compensation arrangements:

**Life insurance**
- Twisting
- Churning
- Sliding

**General insurance**
- Ditching
- Past posting
- Inflated damage

Analysis on behavior through the customer journey:
- Customer acquisition by targeted marketing
- Customer segmentation by customer lifetime value
- Customer engagement by increasing customer wallet share
- Cross-sell/ Up-sell analysis
- Customer retention
- policy churn analysis

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