AI in Insurance – There's a Right Way and a Wrong Way

Colin Priest

ASHK 3rd General Insurance Seminar
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ACTUARIAL SOCIETY of HONG KONG
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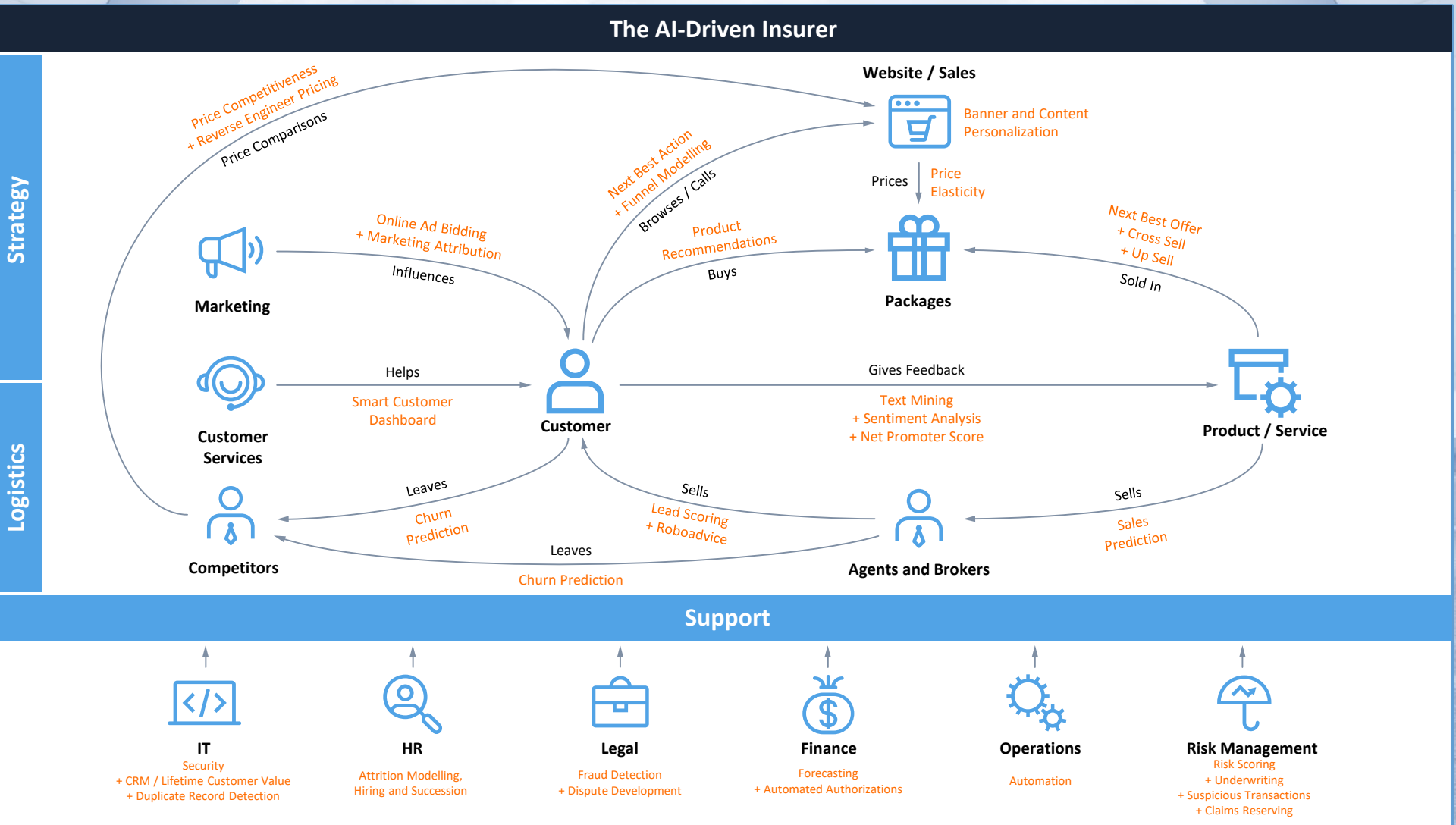
Agenda

What Can Be Automated

The AI-Driven Insurer



Competitive Advantage

Competitive Advantage

A horde of insurtech companies are out-innovating the established traditional insurers.

But the established insurers have more expertise and more data. They will win if they harness the power of AI and ML

Insurance Use Cases

Sales and Marketing
- Cross-sell / Up-sell
- Web page banner and online ad optimization
- Lead scoring
- Single customer view
- Smart customer dashboards
- Lifetime customer value

Underwriting
- Automated underwriting acceptance
- Triage problem applications
- Prioritise medical tests
- Prioritize questions on application form
- Change in quality of business

Claims
- Fraud detection
- Predict and avoid litigation
- Dispute development
- Automated invoice payment / denial
- Identify salvage and subrogation opportunities

Pricing
- Technical pricing
- Dynamic pricing
- Price elasticity
- Competitor prices / market ranking

Risk Management
- Fraud detection
- Model risk and model documentation
- Dispute development
- Anti money laundering
- Emerging risks
- Risk scoring

Investment Management
- Credit risk
- Economic forecasts
- Market dispersion

Actuarial
- Technical pricing
- Claim reserving
- Price elasticity / dynamic pricing
- Risk scoring

Finance
- Budgeting
- Fraud detection
- Cashflow projections
- Automated expense authorization
- Suspicious transaction identification

Life Insurance
- Lead scoring
- Underwriting medical conditions
- Lapse prediction
- Roboadvice
- Cross-sell / up-sell

General Insurance / P&C / Casualty
- Dynamic pricing
- Fraud detection
- Predict and avoid claims litigation
- Risk scoring
- Identify salvage and subrogation opportunities

Medical Insurance
- Automated underwriting acceptance
- Fraud detection
- Automated claim invoice payment / denial
- Trailing invoice prediction

Pet Insurance
- Lead scoring
- Automated invoice payment / denial
- Renewal retention prediction
- Pricing

Insurance Use Cases – Mainstream Best Practice

Mainstream Best Practice

Roboadvice

Objective, individualised insurance product recommendations

Mainstream Best Practice

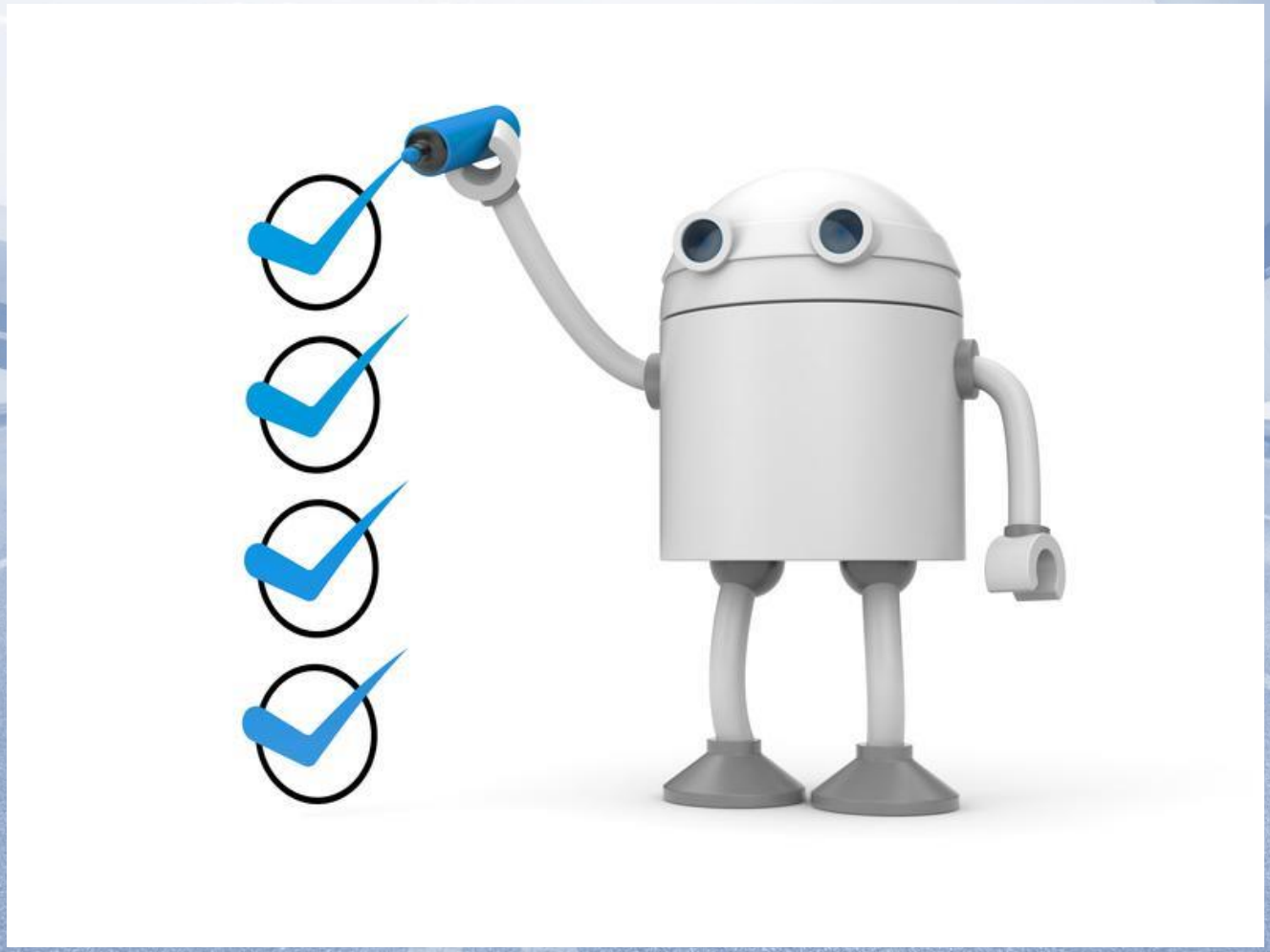
Automated Underwriting

Categorising Insurance Applications:

Standard

Sub-standard

Reject



Mainstream Best Practice

Claims Triage

Automatically flagging claims for immediate payment versus manual review.

Mainstream Best Practice

Suspicious Transactions: Fraud & AML

Automatically flagging applications and claims for special review.

Mainstream Best Practice

Next Best Offer, Cross-Sell and Up-Sell

Marketing campaigns optimised for individual customer characteristics.

Insurance Use Cases – Rapidly Becoming Best Practice

Rapidly Becoming Best Practice

Next Best Action

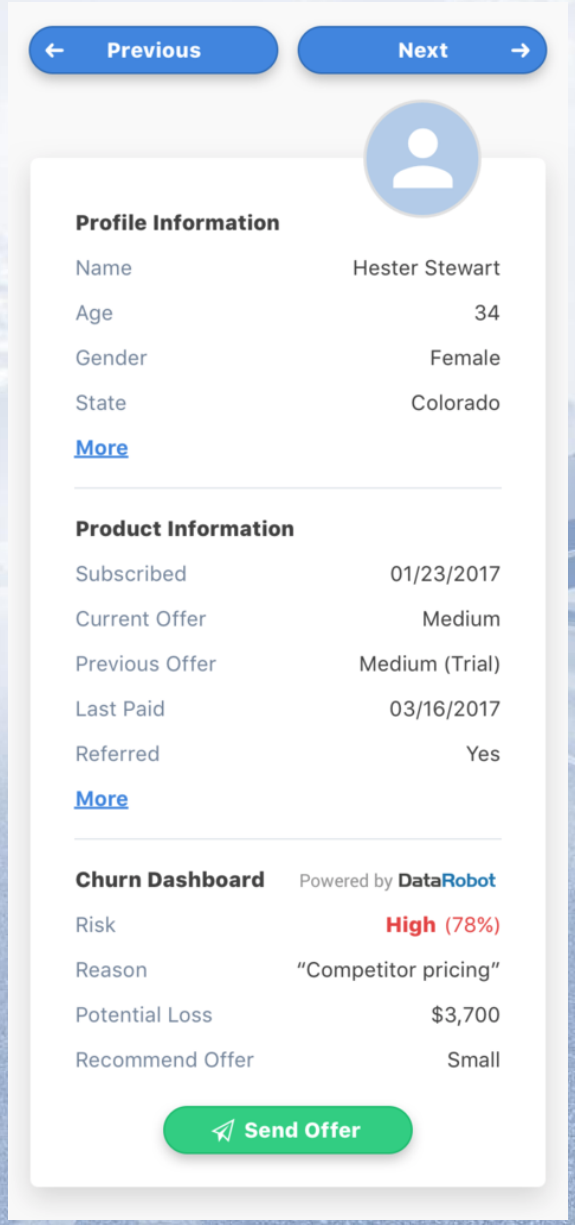
Engaging communication with customers and leads, individualised for both content and timing.

Rapidly Becoming Best Practice

Smart Customer Dashboard

Know your customer:

- Churn probability
- Next best offer
- Net promoter score
- Lifetime customer value



Rapidly Becoming Best Practice

Duplicate Customer Records

Flag customer records that may be duplicates of each other e.g. slightly different spelling or address.

Rapidly Becoming Best Practice

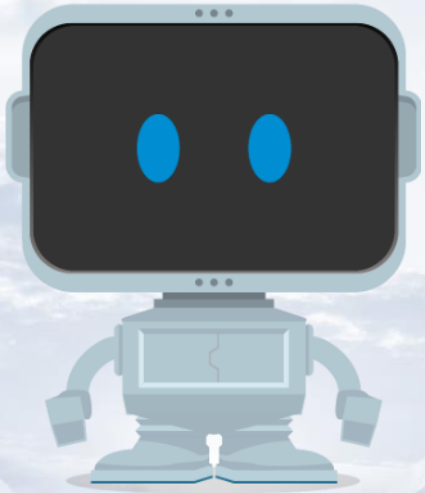
Disputes

Which disputes will end up in legal action? Which ones can be solved by negotiation?

Cyborgs!

Computer Strengths

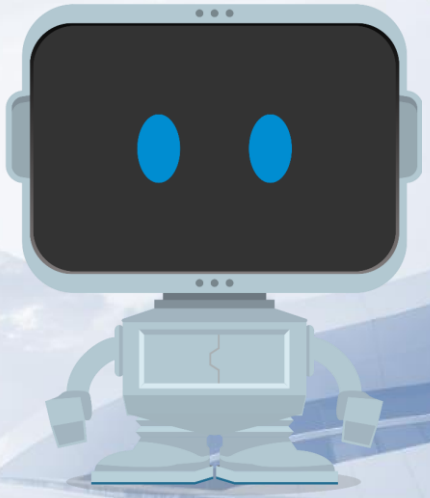
- Repetitive Tasks
- Mathematics
- Data Manipulation
- Parallel Processing



Human Strengths

- Communication and Engagement
- Context and General Knowledge
- Creativity
- Empathy

Humans Versus Computers



- Communication and Engagement
- Context and General Knowledge
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- Repetitive Tasks
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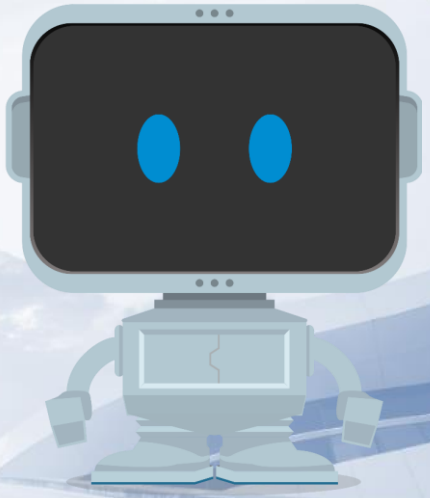
Actuaries Job Description



- Communication and Engagement
- Context and General Knowledge
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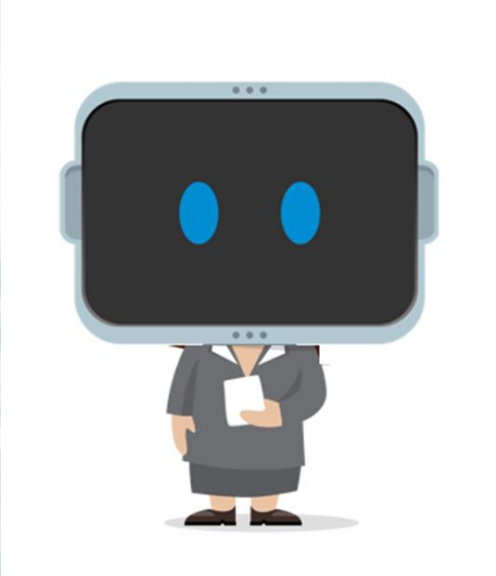
Are Actuaries Cyborgs?



- Communication and Engagement
- Context and General Knowledge
- Creativity
- Empathy

- Repetitive Tasks
- Mathematics
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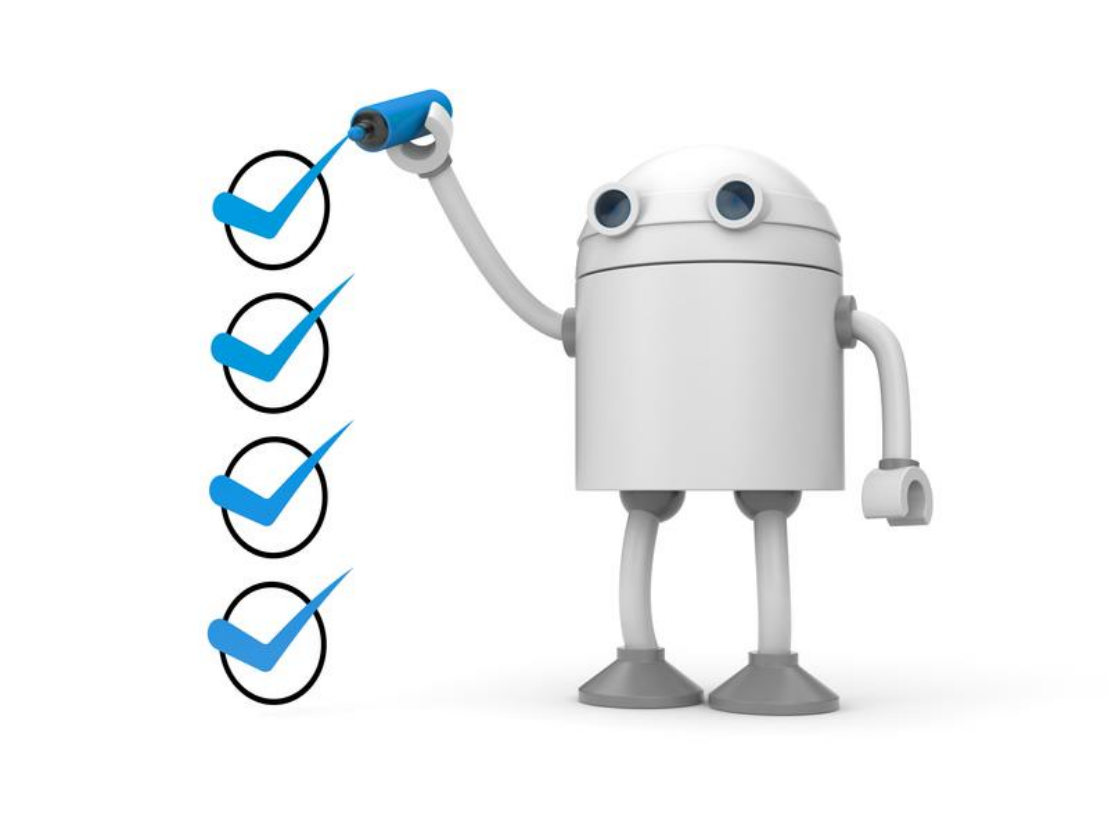
Humans Doing Inhuman Tasks

Inhuman Tasks

Repetitive Tasks

- Underwriting
- Claims Processing



Inhuman Tasks

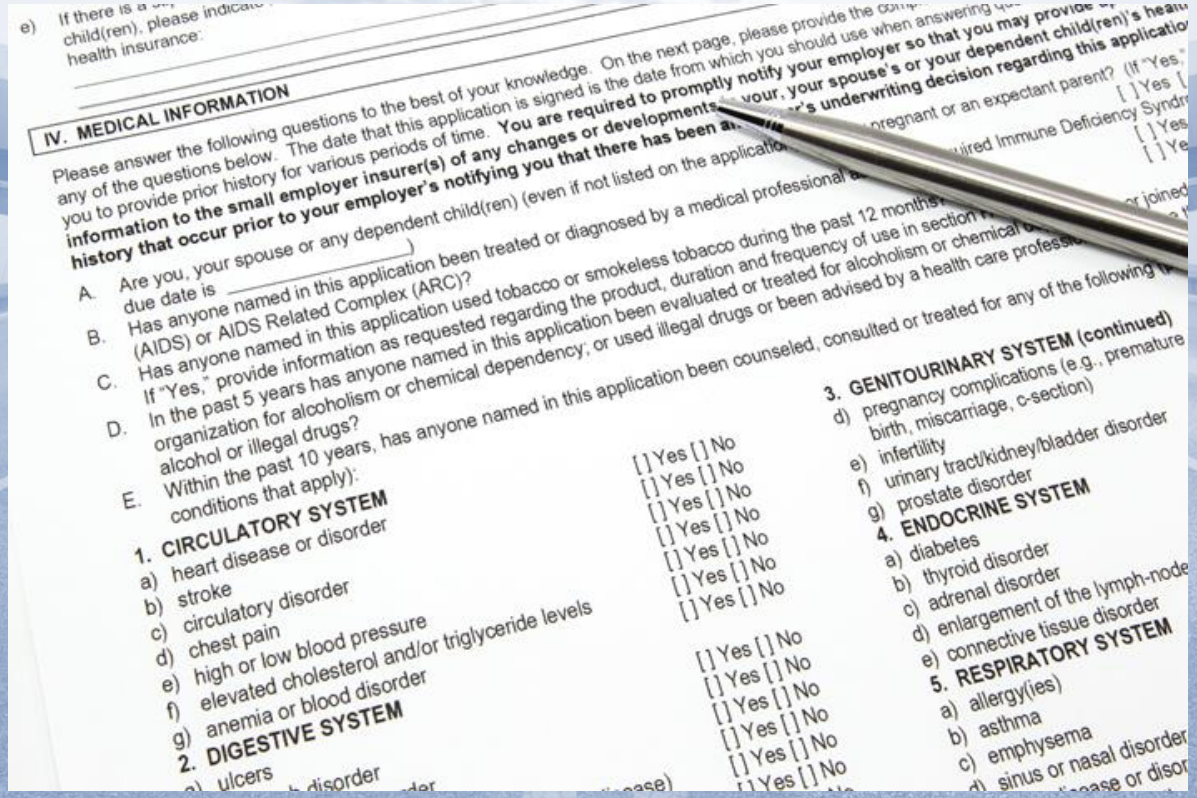
Mathematics

- Premium rate calculations
- Actuarial estimates

Inhuman Tasks

Data Manipulation

- Paper-based insurance applications
- Paper-based claim notifications
- Almost anything that is done in Excel!

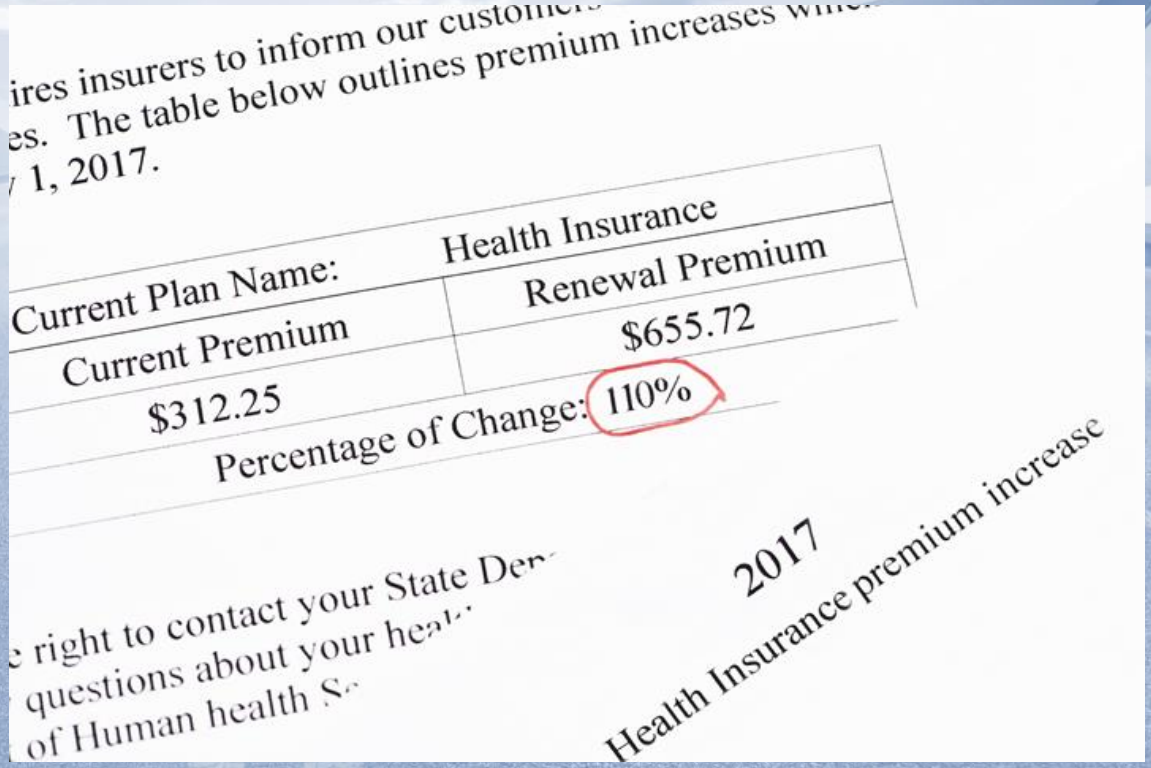


Computers Doing Human Tasks

Human Tasks

Communication and Engagement

- Premium notices
- Negative claims decisions
- Disputes
- Irrelevant / unsolicited emails (junk mail!)
- Chatbots or “Press 1 for...”



Human Tasks

Empathy

- Serious claims
- Pre-existing conditions
- New claim notification
- Unexpected or large premium increases
- Disputes

What Customers Want

What Customers Want

Social

Research shows that “humans are inherently social creatures who get emotional value from seeing and interacting with one another”

Source: https://hbr.org/2018/02/the-parts-of-customer-service-that-should-never-be-automated

What Customers Want

Lessons From Banking

Research has shown that “when banking customers used the ATM more and the teller less, their overall level of satisfaction with the bank went down”

Source: http://onlinelibrary.wiley.com/doi/10.1111/j.1937-5956.2010.01151.x/abstract

What Customers Want

No Roadblocks

Customers hate

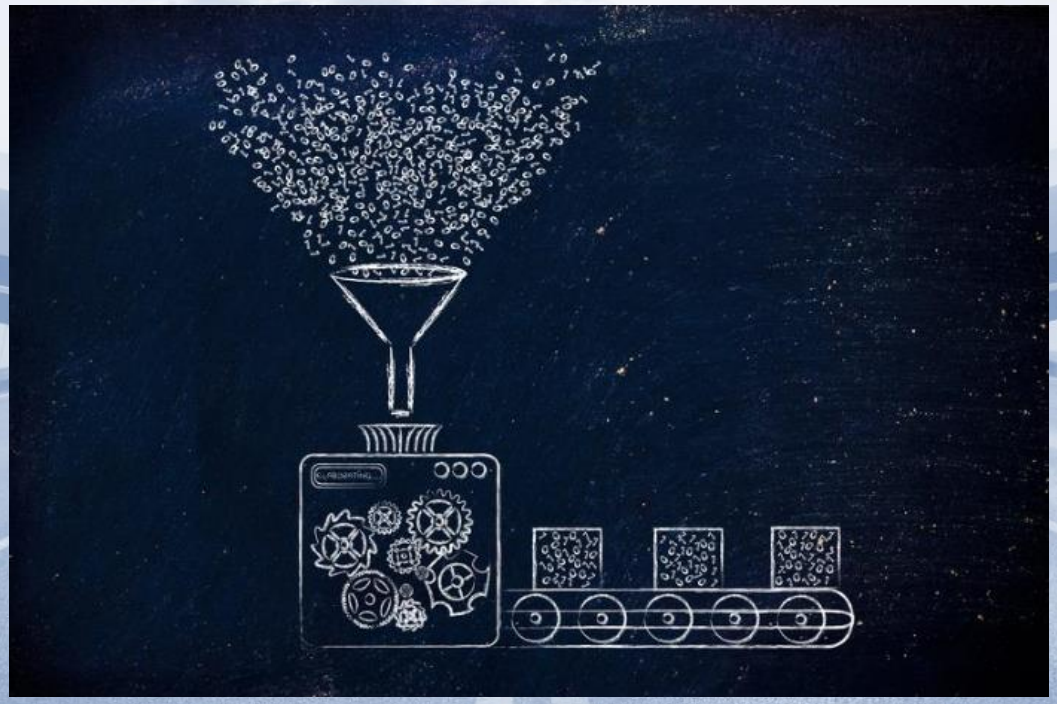
- Paperwork
- Waiting
- Unexplained decisions

Rules to Live By

Rules to Live By

Use AI For Transactions and Processing

Let the AI do work that is mundane, with predictable outcomes, and high volume.



Rules to Live By

Use AI To Triage Problems to Human Staff

AI can refer difficult judgement calls to humans.

For mainstream day-to-day processes, leave it to AI to give speedy solutions.

Rules to Live By

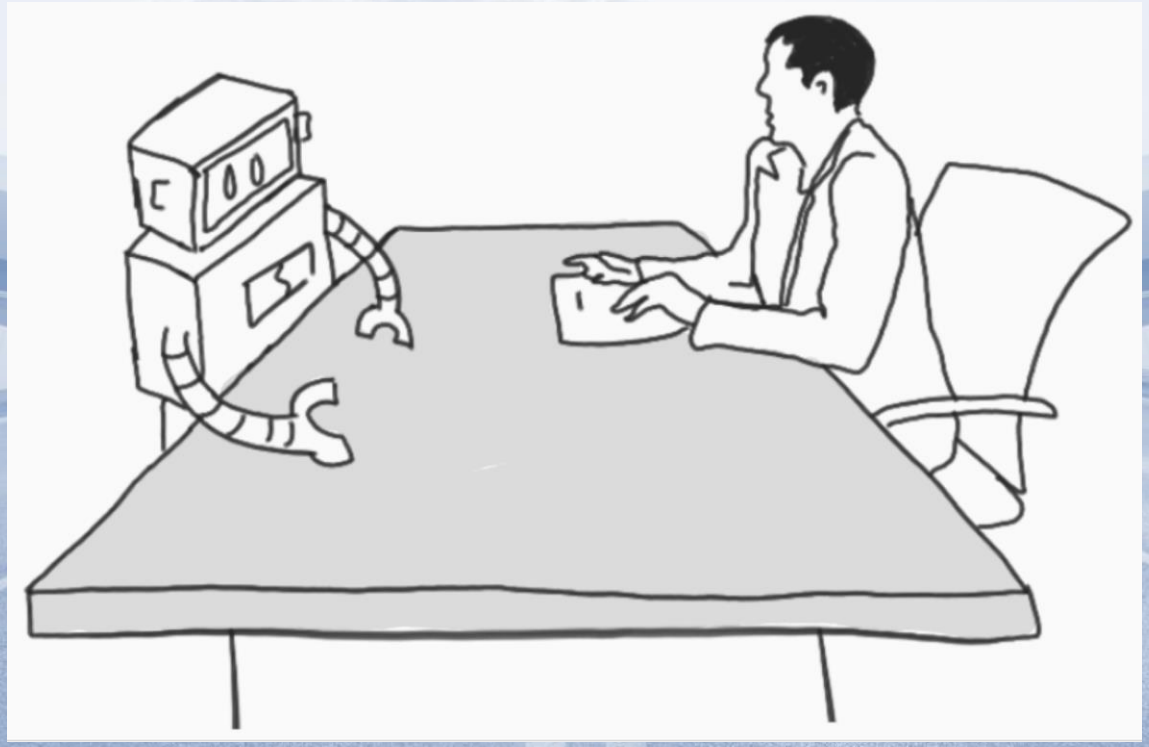
Facilitate Human Interactions Whenever an Issue is Emotional or Social

Don’t push customers away. No more “Select 1 to update your password, Select 2 for a premium payment…”

Give customers the option to contact a human up-front. Then empower that human with AI-driven knowledge e.g. smart customer dashboard

Rules to Live By

Use AIs That Give Human-Friendly Explanations For Decisions

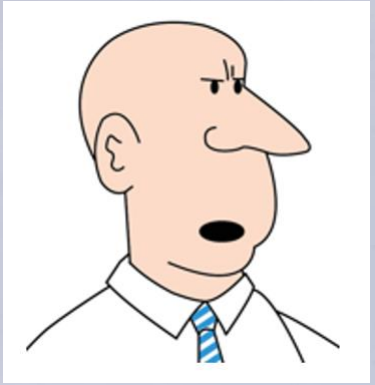


Conclusion

Be an Insurance Superhero Via Automation

Free yourself up to use your human strengths:

- Communicate
- Ask questions
- Apply common sense
- Create new solutions
- Evangelise new ideas
- Generate sales and profit



Colin Priest
Senior Director of Product Marketing
DataRobot
Email: colin@datarobot.com
Twitter: @ColinAPriest
Blog: https://blog.datarobot.com/author/colin-priest

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APPENDIX

What are key models for...

Sales and Marketing

1. ## Cross-Sell and Up-Sell

   It costs less to sell more to an existing customer than to bring in a new customer. DataRobot lets you individually optimize which messages you use to connect with customers and which products you suggest, driving greater sales.

2. ## Web Page Banner and Online Advertising Optimization

   Businesses spend billions of dollars a year on advertising, but is that money well-spent? With DataRobot, marketers attribute sales to advertising activities, optimizing ad spend to bring in more leads for less.

3. ## Lead scoring

   Identifying and engaging high-quality leads is critical to success, but most businesses use guesswork for prospecting. Using DataRobot to predict what content resonates with each prospect improves close rates using data that businesses already have.

4. ## Single Customer View and Smart Customer Dashboards

   Find duplicate customer records to merge into a single customer view to better understand your customers. Treat your customers as individuals by building smart customer dashboards that predict future behaviour e.g. lapse and the product that they are most likely to purchase next.

5. ## Lifetime Customer Value

   Insurance can be a long-term relationship. Estimate the projected future value of your customers.

What are key models for...

Underwriting

1. ## Automated Underwriting Acceptance

   Consumers are becoming more demanding and will switch to competitors if their insurance application processing takes too long. With DataRobot, most applications can be automatically accepted or rejected within seconds.

2. ## Triage Problem Applications

   How much time do your valuable underwriters spend rubber stamping insurance applications? DataRobot can triage difficult and complex cases to senior underwriters for their expert judgement.

3. ## Prioritizing Medical Tests

   Medical tests are prudent for insurance applications, but each test costs money and over many applications this adds up to a lot of money. DataRobot can learn which applications truly need medical tests, and which don’t, reducing underwriting expenses without sacrificing quality.

4. ## Prioritizing Questions on Application Forms

   Consumers can become frustrated filling out application forms. DataRobot can identify which questions are important, and which are redundant, streamlining your application forms.

5. ## Change in Quality of Mix of Business

   Adverse selection can be a risk, even when you maintain underwriting standards. DataRobot can sift through new policy data to automatically identify changes in business mix and predict likely changes in future profitability.

What are key models for...

Claims

1. ## Fraud Detection
   For claims fraud detection, AI far exceeds the effectiveness of legacy rule-based methods, with fewer false positives and fewer missed opportunities for claims savings.

2. ## Predict and Avoid Litigation
   Predict which claims are likely to result in litigation, and minimize unnecessary legal costs by pro-actively making targeted settlement offers.

3. ## Dispute Development
   Triage disputes that are likely to develop into problem claims.

4. ## Automated Invoice Payment and Denial
   Streamline the process of submitting and responding to claims by triaging complex decisions to senior claims staff, while automating invoice payment and denial for mainstream claims.

5. ## Salvage and Subrogation
   Reduce claims costs by identifying opportunities for salvage and subrogation.

What are key models for...

Pricing

1. ## Technical Pricing

   Claims are typically the largest cost in insurance, but they can also be difficult and time consuming to predict. DataRobot builds validated rating tables that can be downloaded for use in pricing submissions..

2. ## Dynamic Pricing

   Optimize your pricing by adapting to changing market conditions, allowing for both supply and demand.

3. ## Price Elasticity

   Discover the effects of pricing on customers' decisions to renew or purchase.

4. ## Competitor Prices / Market Ranking

   If you price too high versus your competitors, you not only will lose business to them, you also risk adverse selection. You also don't want to price lower than necessary. However, it is not practical to get a competitor quote for each policy application. DataRobot can reverse engineer your competitor's rating structure from a basket of quotes, enabling you to avoid the risk of mispricing.

What are key models for...

Risk Management

1. ## Fraud Detection and Anti Money Laundering

   For fraud detection and anti money laundering, AI far exceeds the effectiveness of legacy rule-based methods, with fewer false positives, higher accuracy and the ability to quickly learn from and adapt to new behaviours.

2. ## Model Risk and Model Documentation

   With ring-fencing to ensure best practice data science, automated model documentation, and one-click deployment, DataRobot minimizes model risk and operational risk.

3. ## Dispute Development

   Which disputes will escalate into legal action? DataRobot can learn to predict which disputes will be resolved and which are more likely to become problematic.

4. ## Risk Scoring

   Use historical data to quantify and rank the quality of insurance risks, estimating frequency and severity.

5. ## Emerging Risks

   Emerging risks can remain undiscovered in your risk event register. With built-in text mining, DataRobot can find emerging patterns in complex data.

What are key models for...

Investment Management

1. ## Credit Risk

   Insurers' investment portfolios typically include bonds, structured transactions and secured lending (i.e., mortgage loans), among others. With increasing regulatory pressure and ongoing economic turbulence, credit risk management is moving up the agenda for senior management. Insurers can use DataRobot to estimate their investment credit risk.

2. ## Economic Forecasts

   Investment strategy hinges on the economic cycle. Use DataRobot to predict the values of key economic statistics, such as unemployment and inflation, before the numbers are released.

3. ## Market Dispersion

   The success of active vs. passive stock picking is cyclical and is largely tied to the level of dispersion among stocks as well as general market volatility. DataRobot can predict whether stock market dispersion will be high or low, enables insurers to tactically use active trading only when the potential for outperformance is greater than the costs of actively trading.

What are key models for...

Actuarial

1. ## Technical Pricing

   Claims are typically the largest cost in insurance, but they can also be difficult and time consuming to predict. DataRobot builds validated rating tables that can be downloaded for use in pricing.

2. ## Claim Reserving

   Traditional actuarial techniques summarise claims into development triangles, upon which reserving techniques such as chain ladder can be applied. But summarised data provides few data points for estimating inflation, and can hide structural changes in an insurance portfolio that could be misinterpreted as inflation. These issues can be overcome by building statistical case estimate models that predict the ultimate cost of individual claims, allowing for their individual characteristics including text mining of claim descriptions.

3. ## Price Elasticity / Dynamic Pricing

   Discover the effects of pricing on customers' decisions to renew or purchase. Optimize your pricing by adapting to changing market conditions, allowing for both supply and demand.

4. ## Risk Scoring

   Use historical data to quantify and rank the quality of insurance risks, estimating frequency and severity.

What are key models for...

Finance

1. ## Budgeting
   Insurance budgeting can be complex. By utilizing the power of automated machine learning, DataRobot can estimate future sales, income and expenses.

2. ## Suspicious Transactions / Fraud Detection
   For fraud detection and transaction flagging, AI far exceeds the effectiveness of legacy rule-based methods, with fewer false positives, higher accuracy and the ability to quickly learn from and adapt to new behaviours.

3. ## Cash Flow Projections
   DataRobot can estimate the timing of future cash flows for sales, investments, claims and expenses.

4. ## Automated Expense Authorizations
   Many expense authorizations are just rubber stamped. Let DataRobot automatically authorize the straightforward cases, and triage the more difficult cases to your experienced finance team.

What are key models for...

Life Insurance

1. ## Lead scoring

   Identifying and engaging high-quality leads is critical to success, but most businesses use guesswork for prospecting. Using DataRobot to predict what content resonates with each prospect improves close rates using data that businesses already have.

2. ## Underwriting Medical Conditions

   Consumers are becoming more demanding and will switch to competitors if their insurance application processing takes too long. With DataRobot, most applications can be automatically accepted or rejected within seconds.

3. ## Lapse Prediction

   With life insurers facing significant new business acquisition costs, you don’t want to lose those valuable new customers to lapses. DataRobot can predict which customers are most likely to lapse, enabling insurers to target those customers for retention campaigns.

4. ## Roboadvice

   Improve trust in financial advice by moving to data-driven product and investment advice.

5. ## Cross-Sell and Up-Sell

   It costs less to sell more to an existing customer than to bring in a new customer. DataRobot lets you individually optimize which messages you use to connect with customers and which products you suggest, driving greater sales.

What are key models for...

Property and Casualty Insurance

1. ## Price Elasticity / Dynamic Pricing
   Discover the effects of pricing on customers' decisions to renew or purchase. Optimize your pricing by adapting to changing market conditions, allowing for both supply and demand.

2. ## Fraud Detection
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3. ## Predict and Avoid Litigation
   Predict which claims are likely to result in litigation, and minimize unnecessary legal costs by pro-actively making targeted settlement offers.

4. ## Risk Scoring
   Use historical data to quantify and rank the quality of insurance risks, estimating frequency and severity.

5. ## Salvage and Subrogation
   Reduce claims costs by identifying opportunities for salvage and subrogation..

What are key models for...

Medical Insurance

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3. ## Automated Invoice Payment and Denial

   Streamline the process of submitting and responding to claims by triaging complex decisions to senior claims staff, while automating invoice payment and denial for mainstream claims.

4. ## Trailing Invoice Prediction

   Not all medical invoices arrive at once. Some invoices can arrive days or weeks after treatment, delaying claim handling. These late invoice amounts can be estimated by models that predict the ultimate cost of individual claims, allowing for individual characteristics and medical treatments.

What are key models for...

Pet Insurance

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   Streamline the process of submitting and responding to claims by triaging complex decisions to senior claims staff, while automating invoice payment and denial for mainstream claims.

3. ## Renewal Retention Prediction

   With insurers facing significant new business acquisition costs, you want to retain those valuable new customers at renewal time. DataRobot can predict which customers are most likely to renew, and which are not,, enabling insurers to target those at-risk customers for retention campaigns.

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