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Digital Behavior – A Hidden Treasure

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- Move towards using actuarial strengths in business-wide areas?

Need to understand Customer and Risk both

Are traditional risk based approaches enough?

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Traditional Approaches – Can we get answers to these?

- Individuals driving similar cars with same traffic and road conditions – Should they be charged same price?
- Price, Brand or Customization – What matters to a customer ?
- Know more about a customer – What should we know more ? Can we then Price better ?
- Which lead has a higher chance of becoming a customer?
- …..And we can continue to find endless questions

How Can actuaries bridge this gap and provide an enterprise wide solutions using data <u>that can be derived</u> to know more about a customer

Digital Data/Behavior for Actuaries

What is digital data and what inference can be drawn

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Data Point	Significance	Inference
Assisted vs. Unassisted Purchases	Unassisted has around 10%-15% lower LRs	Explains about customer's independence and understanding in choosing a product
Days to expiry in existing policy	Early renewals show 10% lower LRs	Explains about customer awareness and possibly management of personal finances
Credit Score	750+ credit score has 30% lower frequency compared to credit score less than 700	Explains about customer's financial stress – possibly linked to claim propensity
Number of times word "Claims" used during conversation	Multiple usage of word "Claims" translates to LRs beyond 100%	Explains about how likely the customer is inclined to make a claim

Digital Data/Behavior for Actuaries

What is digital data and what inference can be drawn – contd..

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Data Point	Significance	Inference
Length of time spent in choosing a product	Quick buyers show a 12% lower propensity to claim	Explains about customer's inclination to have insurance in place and not bothered about claiming
Existing customer of other product	SI of more than 1Cr in term life shows lower frequency in health and motor claims	Explains about customer's risk aversion
Cross-Product	Tends to convert at 2x more	Explains about customer's affinity with a brand and convenience in making a decision
Source of lead generation	App leads convert 4x more than overall average	Explains about customer's inclination to buy online

The list continues with more than 50 parameters studied

Techniques used to model Digital Data

Pvt. Cars – Increase in Unassisted Share

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GLM Model created – Response Variable considered "Direct (Unassisted) Booking"

Propensity model built using a Binomial distribution function and Logit link function

Parameters Considered

1. Lead Source
2. Selection in 5 minutes
3. V. Make
4. V. Model
5. NCB
6. V. Age
7. Fuel
8. Geography
9. Time to Expiry
10. Time in journey
11. Prev. Term Booking
12. SI in Term
13. Prev. TW Booking(s)
14. Prev. Motor Booking
15. Prev. Insurer
16. Previous NCB
17. Prev. Health Booking
18. SI in Health
19. Prev. Travel Booking(s)
20. Prev. Investment Booking
21. Day and time of lead creation
22. Time spent on each page

Model assigned a propensity score to each lead – higher the score, higher the time for which lead kept unassigned

Share of unassisted business increased from 35% (overall) to 48% (on pilot data)

Techniques used to model Digital Data

Pvt. Cars – Increase in Unassisted Share - Benefits

Cost savings to Policybazaar (PB) – Significant reduction in agent costs

Beneficial for Insurers – Direct correlation with lower LRs

Helpful to PB's Operations team – time of agents spent on leads that need assistance

Helpful to PB's Marketing team– Marketing spends channelized towards source (data segments) that creates more unassisted leads

Insights for PB's BD team– Give insights on price vs. brand value for each insurer

Overall value proposition to PB's shareholders – Helps in generating overall efficiencies in a low premium high transactions product

Techniques used to model Digital Data

Pvt. Cars – Understanding risk from Claims perspective

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20% claims frequency imply 80% profitable business – Still UW losses

Insurers with high rate realization also showing LRs that are leaving no/little margins

Where can the problem be?

Are we ignoring data that is available and is a good proxy to understand risk better

Financial

Profession

Risk Coverage

Brand Affinity

Behavioral

Risk Profile

Referrals

Driving style

Kms. Driven

Debt/Mortgage

Lead Source

Techniques used to model Digital Data

Pvt. Cars – Use of AI – Frequency Outcome

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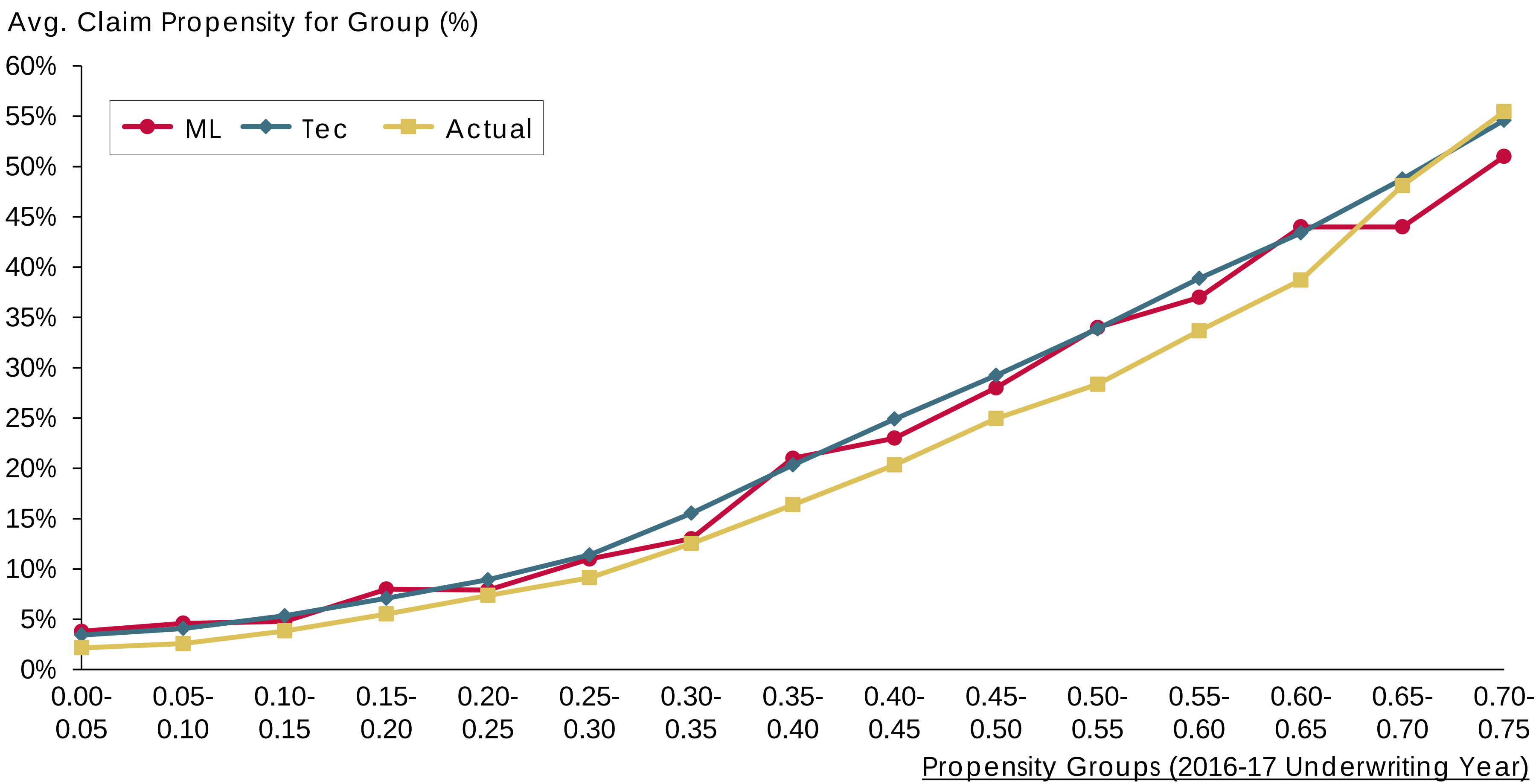
Based on only Traditional Risk Parameters – in AI



AI on traditional parameters compared with tec. (traditional and digital) and actual data shows multiple discontinuities in AI curve

Techniques used to model Digital Data

Pvt. Cars – Use of AI – Frequency Outcome

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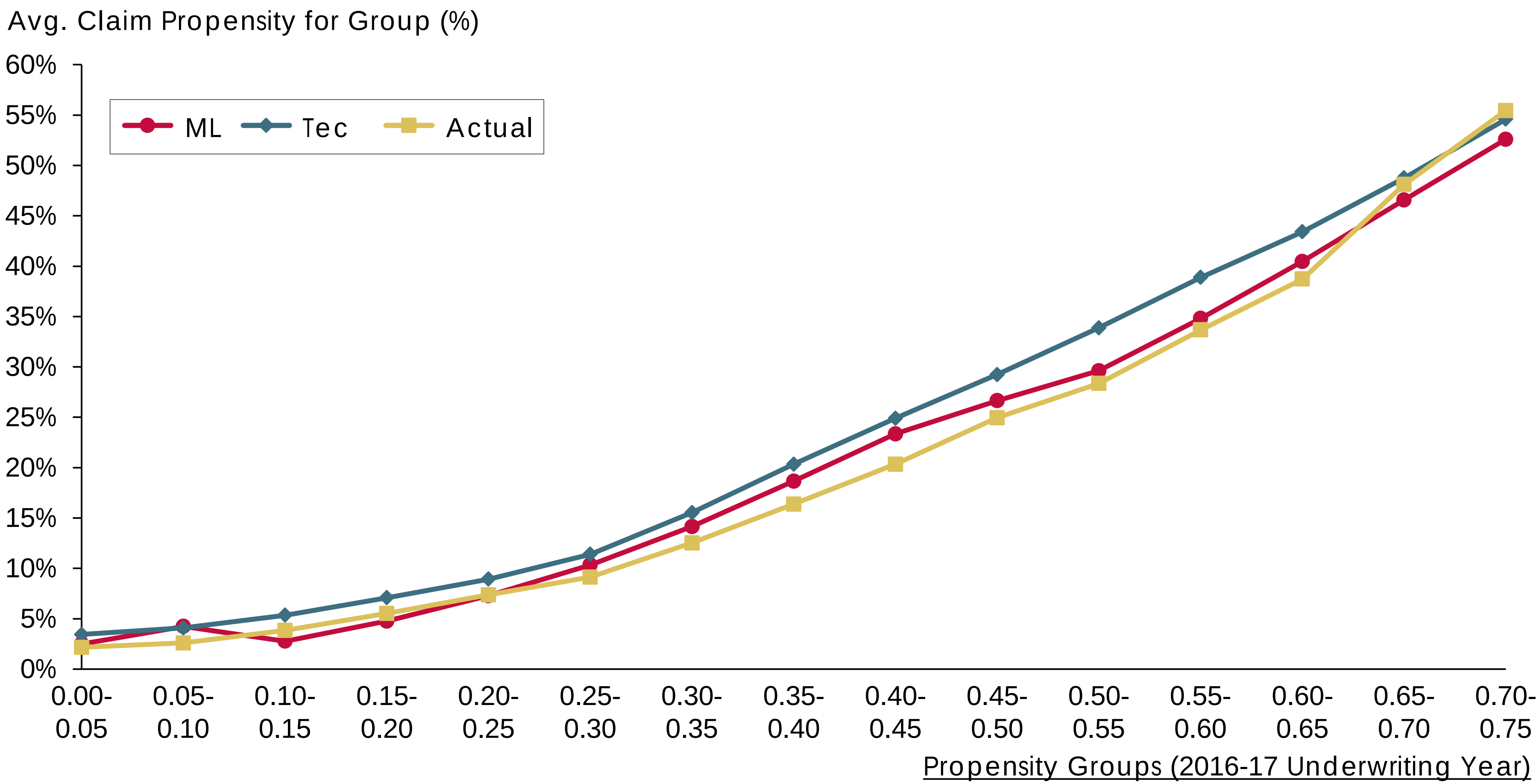
Based on only Traditional + Digital Parameters – in AI



AI curve on traditional and digital parameters smoothens out and provides similar gradient as actual and technical curves on frequency

Techniques used to model Digital Data

Health Propensity – Increase in Conversions

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GLM Model created – Response Variable considered "Is Booked"

Propensity Model	Premium Model
• Link Function : Logit • Distribution: Binomial	• Link Function : Log • Distribution: Gamma

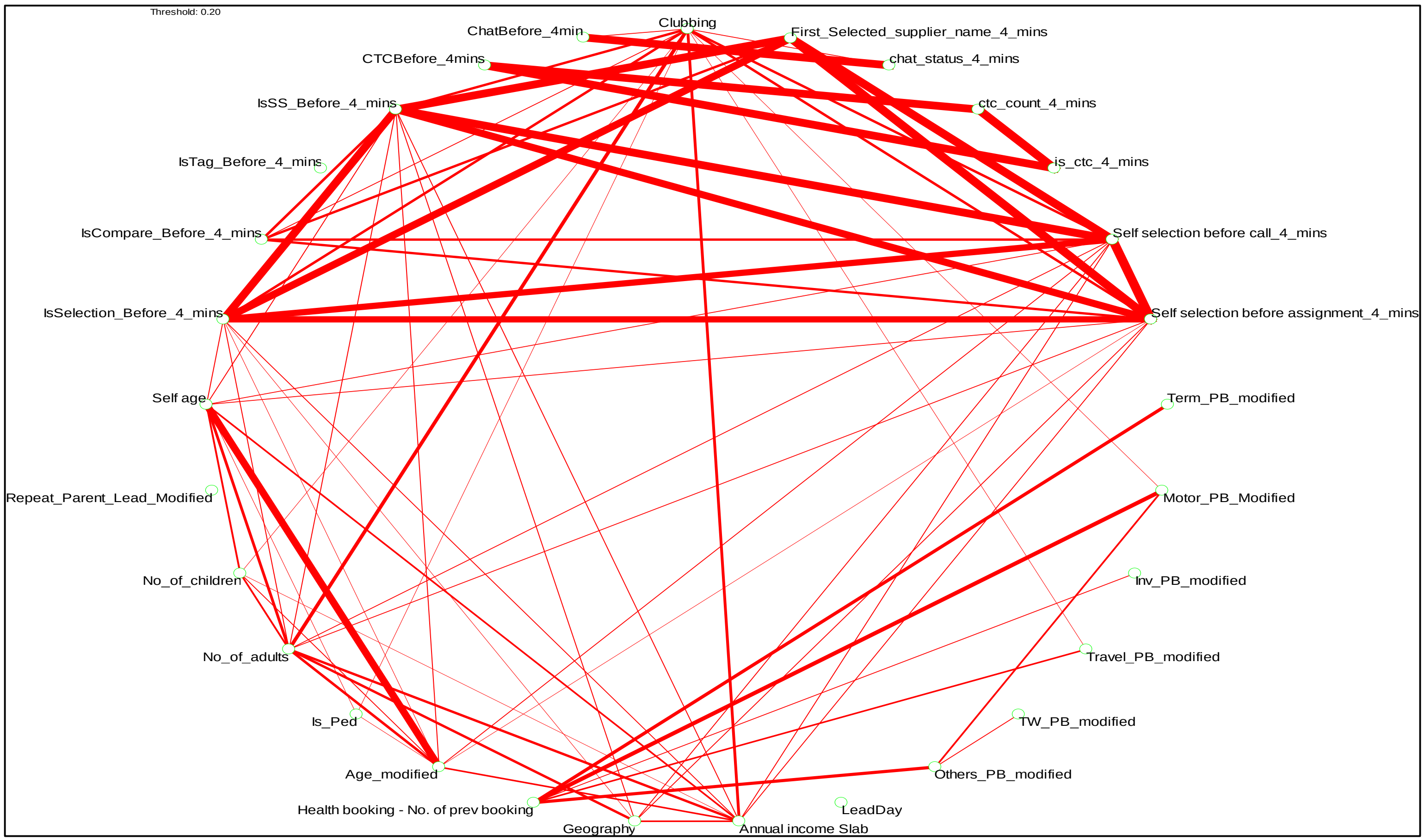
Parameters Considered

1. Lead Source
2. UTM Source
3. UTM Medium
4. Compare
5. Tag
6. Repeat Parent Lead
7. IS PED
8. No. of Children
9. No. of Adults
10. Self Age
11. Geography
12. No. of prev. health booking
13. Annual Income
14. Prev. Term Booking
15. Prev. Tw Booking
16. Prev. Motor Booking
17. Prev. Travel Booking
18. Prev. Investment Booking
19. Lead Time
20. First selected insurer
21. Self selection before call
22. Self selection before assignment
23. CTC count
24. Chat status
25. Gender
26. Lead Day
27. Selected Premium Range by user

Techniques used to model Digital Data

Health Propensity – Increase in Conversions

Correlation studied to check if any factors needed to be removed



Techniques used to model Digital Data

Health Propensity – Increase in Conversions

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Parameters reduced to include mainly independent parameters

Propensity Model	Premium Model
• Link Function : Logit • Distribution: Binomial	• Link Function : Log • Distribution: Gamma

Parameters Considered

1. Lead Source
2. UTM Source
3. UTM Medium
4. Compare
5. Tag
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20. First selected insurer
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22. Self selection before assignment
23. CTC count
24. Chat status
25. Gender
26. Lead Day
27. Selected Premium Range by user

Parameters Used in final Model

- Lead Source
- UTM Source
- Compare
- Repeat Parent Lead
- IS PED
- No. of Children
- Self Age
- Geography
- No. of prev. health booking
  Annual Income
- Prev. Term Booking
- Prev. Tw Booking
- Prev. Investment Booking
- Lead Time
- First selected insurer
- Chat status
- Gender

Techniques used to model Digital Data

Health Propensity – Increase in Conversions

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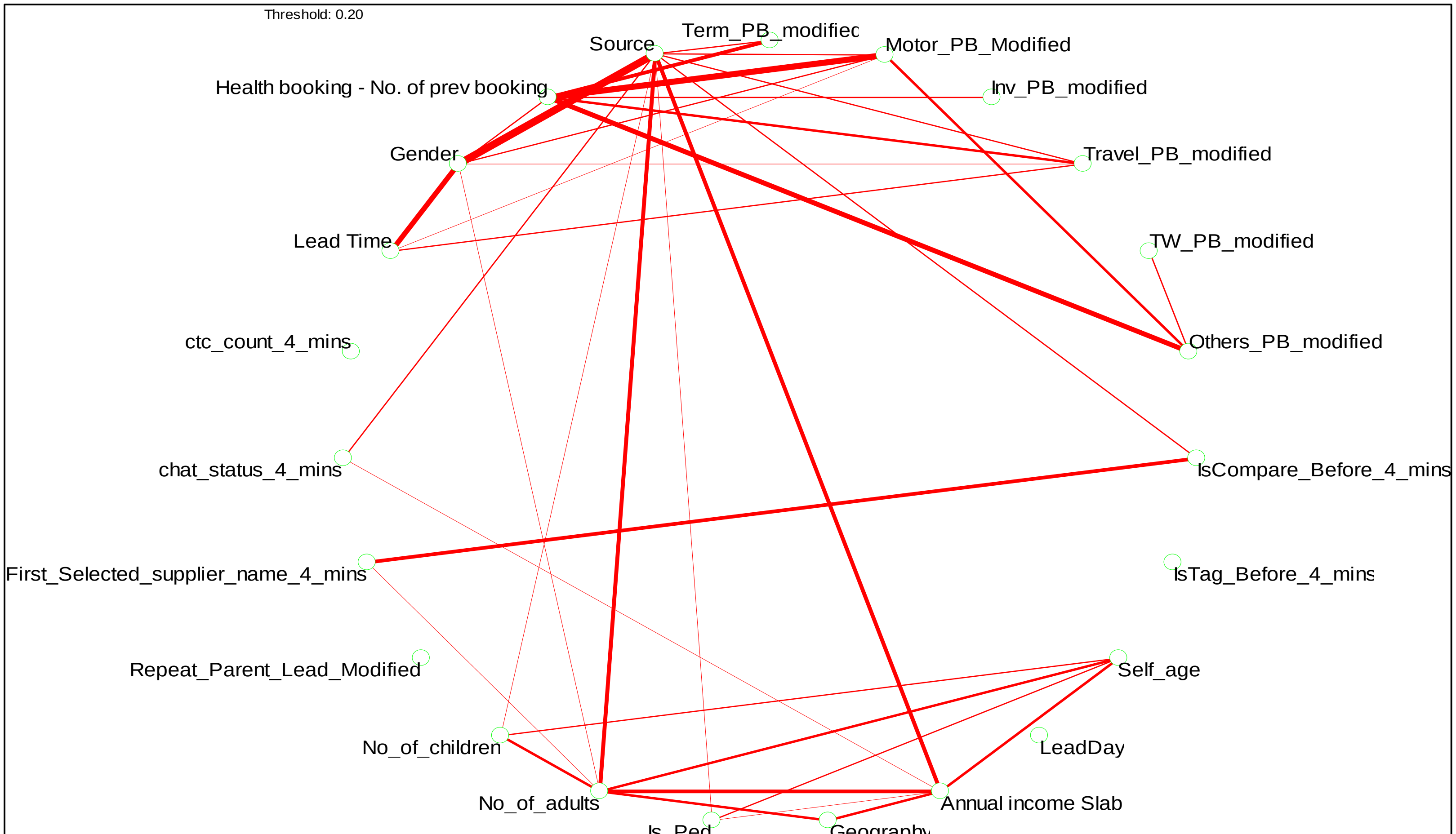
Revised Correlation Chart



Techniques used to model Digital Data

Health Propensity – Increase in Conversions

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Multiple interactions created to capture the combined effect

Lead Grade	Propensity Level	Lead Share	Bookings Share	Strength of Actuarial Model
A1	0.7-0.8 0.6-0.7 0.5-0.6 0.4-0.5 0.3-0.4 0.2-0.3 0.1-0.2	5%	22%	2.3x
A2	0.095-0.1 0.09-0.095 0.085-0.09 0.08-0.085 0.075-0.08 0.07-0.075 0.065-0.07 0.06-0.065	9%	20%	1.7x
A3	0.055-0.06 0.05-0.055 0.045-0.05 0.04-0.045 0.035-0.04 0.03-0.035	26%	32%	1.2x
A4	0.025-0.03 0.02-0.025 0.015-0.02 0.01-0.015	35%	22%	0.8x
A5	0.005-0.01 0-0.005	25%	4%	0.4x

Techniques used to model Digital Data

Health Propensity – Increase in Conversions

14% leads converted into 42% of overall health business

Assignment of high converting leads when happening on pure segmentation basis was not giving desired efficiencies

A1 leads showed 2.3x higher conversion when compared with earlier segmentation based models

60% leads that were originally being given full effort actually fell into lowest range of conversion propensity – can be assigned to low ranked agents / use for training purposes

Health propensity model provided the best possible outcome for PB – Margins improvement, most optimal utilization of operations team, clear vision for marketing team for spends, more time now being spent in improving customer experience further and all these bringing increased ROI for shareholders

Actuarial strengths in business-wide areas

Are we ready to take our skills in non-traditional roles?

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- Actuarial applications at PB showed all round efficiencies for BD, Operations, Marketing and Partners

- Internal efficiencies are gaining strength, we can step up to take the challenge further – helping partners differentiate between good and bad risk

- There is enough data that suggests that industry can move back towards pure technical pricing

- Actuaries – Underwriters, Data people, Data scientists……

- Together we can demonstrate to stakeholders and regulator that the bank of data residing within our servers is a treasure

A treasure that is hidden but not yet hidden!!

Thank You

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