CAS Spring Meeting 2007

The Business Case for Predictive Modeling

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Agenda

- Business Motivations for Predictive Modeling – The Business Case

- A Sample Benefit Calculation

- How to Measure Benefits on a Go-Forward Basis

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It's a Business Initiative

What PM is NOT

- A Black Box approach

- Stork delivery

- Replacement for underwriters

- Score used to communicate decision

- Score drives results

- A single variable magic bullet

- Actuarial and/or systems project

- Class plan underwriting
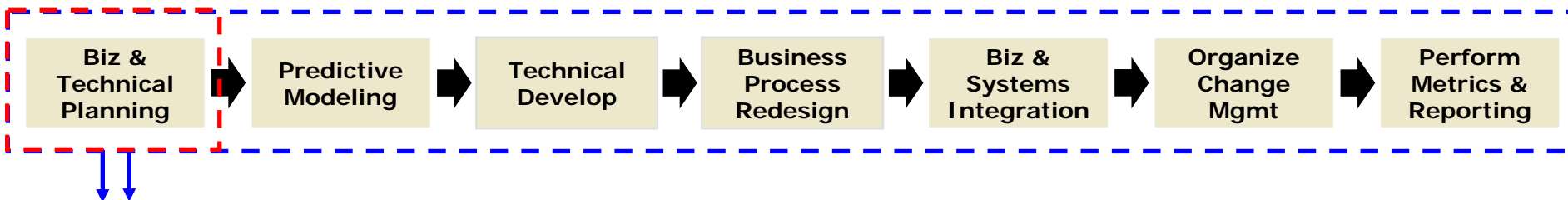
What PM IS

- Scoring drivers are known / understood

- Collaborative with knowledge transfer

- Additional underwriting toolset

- U/W reason messages are developed

- Implementation drives results

- Relationship among variables is power

- Business initiative

- Efficient segmentation of policyholders

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Predictive Modeling Lifecycle

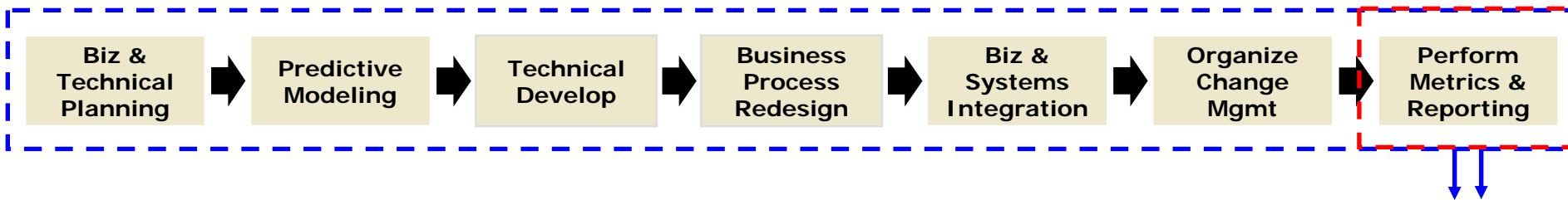| Biz & Technical Planning	▶	Predictive Modeling	▶	Technical Develop	▶	Business Process Redesign	▶	Biz & Systems Integration	▶	Organize Change Mgmt	▶	Perform Metrics & Reporting

- Predictive Models must be effectively implemented to derive their benefit potential

- The financial benefits can be so significant that urgency should drive the pace of the project

- Create a benefit analysis and use the benefits to drive the project – a complex process (PIF counts, LR management, retention, not written, etc)

- Competitive jockeying drives the project pace – first adopter and fast follower advantages

- A best practice is to create a continuum of implementation solutions and phases

- Initial implementation should focus on extracting value from models before automation

- Tactical implementation can be achieved in 2-4 months

- Planning, planning, and then some more planning

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Start with Planning

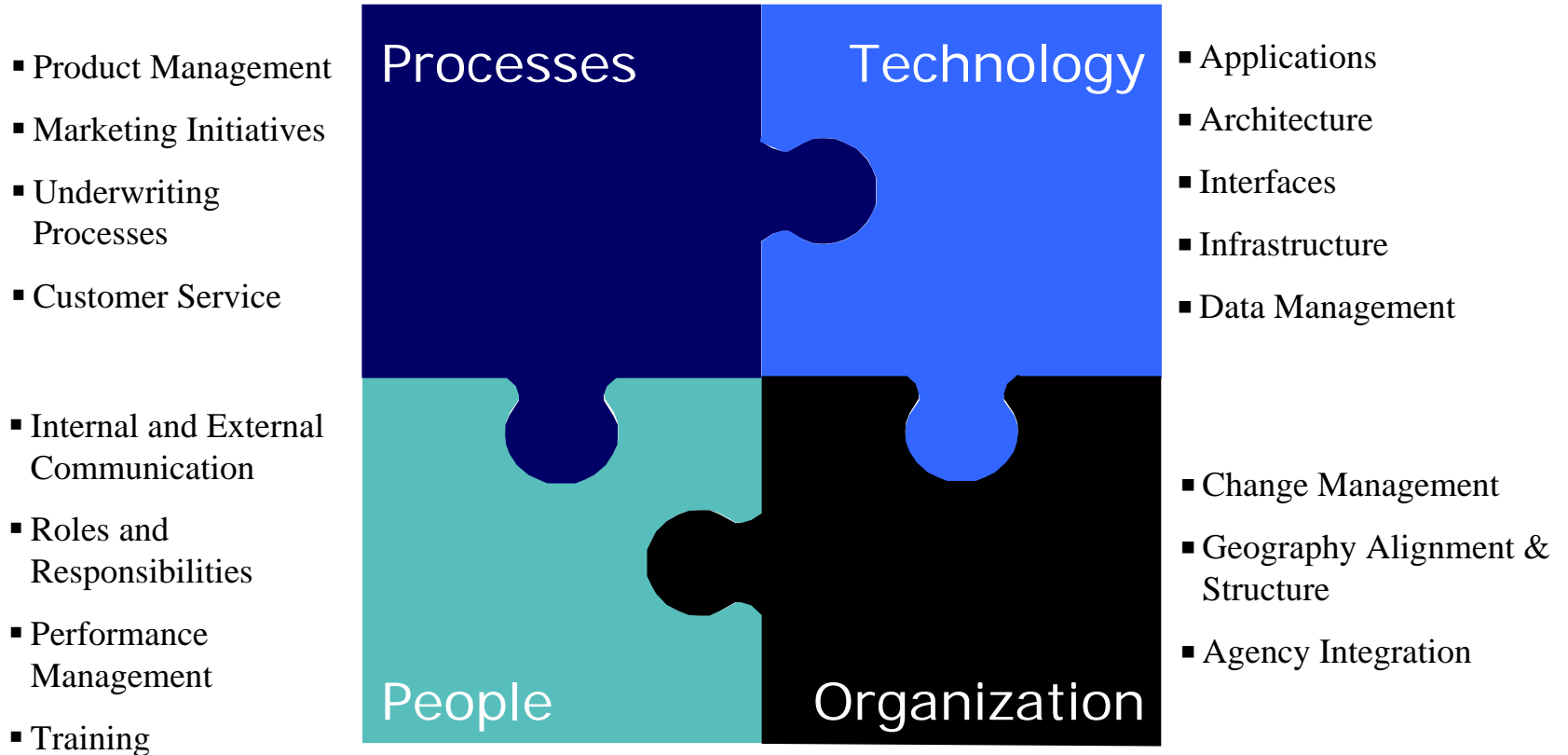| Biz & Technical Planning	Predictive Modeling	Technical Develop	Business Process Redesign	Biz & Systems Integration	Organize Change Mgmt	Perform Metrics & Reporting

- Steering Committee and Project Committee Structure

- Phased structure and focus on 80:20 Rule

- Development of End-State-Vision & Project Planning Document – some key questions are:

  - How will predictive modeling guide decision making, pricing, etc?

  - How will predictive models impact existing business processes?

  - How will predictive models be blended into the field and agency management process?

  - What key performance measures must be achieved?

  - How will underwriters/raters/other personnel's compliance be measured?

  - What level of automation is desired for various business processes?

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Report of Business Case Metrics Defined during Planning

Biz & Technical Planning	Predictive Modeling	Technical Develop	Business Process Redesign	Biz & Systems Integration	Organize Change Mgmt	Perform Metrics & Reporting

- Creation of management reports and metrics measurement processes including dashboards

- Communication of model usage, results tracking, and management metrics at all process points to all constituencies

- Loop back processes to manage compliance or deviation of model usage business plan

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Critical Success Factors

- Product Management
- Marketing Initiatives
- Underwriting Processes
- Customer Service

- Internal and External Communication
- Roles and Responsibilities
- Performance Management
- Training

Processes

Technology

People

Organization

- Applications
- Architecture
- Interfaces
- Infrastructure
- Data Management

- Change Management
- Geography Alignment & Structure
- Agency Integration

- Non-Critical Success Factors
  - Software & Hardware
  - Modeling methodologies and algorithms
  - Actuarial project components – over design of modeling methodology
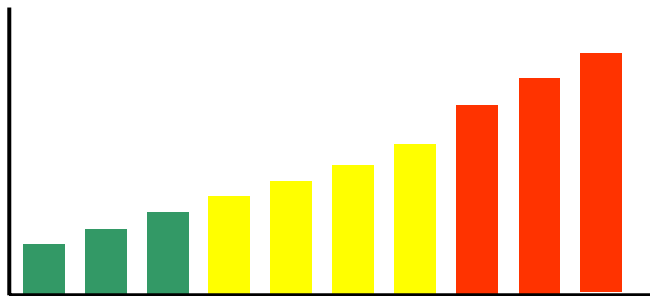
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Identify the Business Application – Targeted Non-Renewals

Business Application

- **Targeted Non-Renewals**
  - Cancel worst-of-the-worst
- **Improve Retention**
  - Retain the most profitable
- **Renewal Pricing**
  - Pricing actions determined by policy score rather than class
- **New Business Growth**
  - Use new insights to target the best business

Business Case Estimated Benefit

2.4 — Targeted Non-Renewals
1.2 — Renewal Pricing
0.4 — Improve Retention
1.0 — NB Growth
5.0 — Total
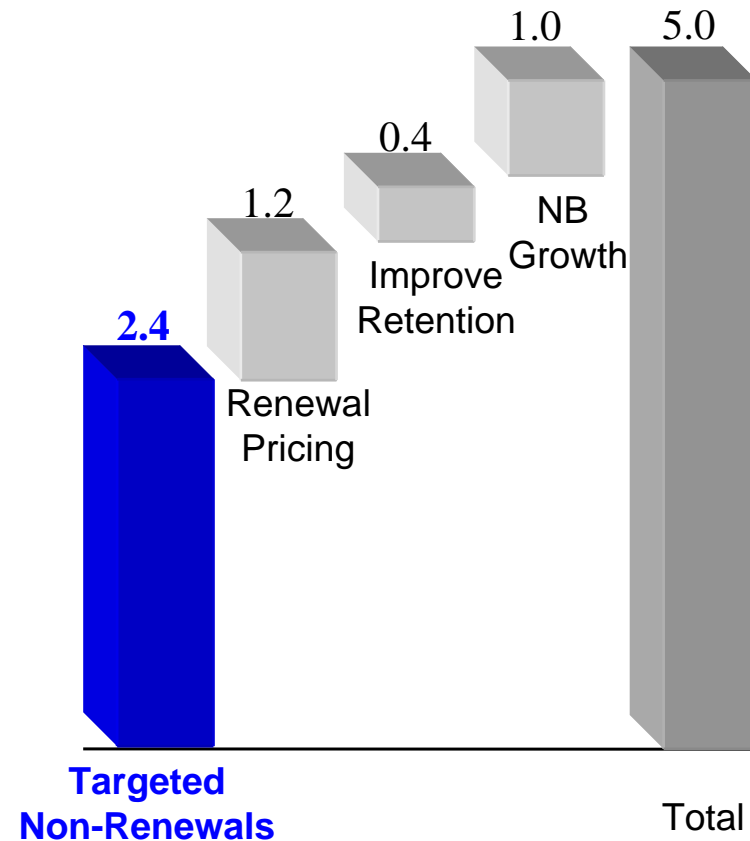
Loss Ratio Savings

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Benefit Calculation Assumptions – Targeted Non-Renewals

#1 ▶ Identify the existing & proposed non-renewal rate

#2 ▶ Determine the historical and proposed non-renewal impact

#3 ▶ Quantify the number of policies affected, existing loss ratio, etc.

#4 ▶ Calculate the estimated net business value for targeted non-renewals

#5 ▶ Develop a method for measuring the actual benefits on a go-forward basis

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Sample Benefit Calculation - Targeted Non-Renewals

| Decile | Net Underwriting Profit / Loss | Current Non-Renewal | | Proposed Non_Renewal | | Business Case Benefit |
		Non Renewal Rate	Business Impact	Non Renewal Rate	Business Impact	
1	$3,450,000	0.0%	$0	0.0%	$0	$0
2	$2,820,000	0.0%	$0	0.0%	$0	$0
3	$2,190,000	0.0%	$0	0.0%	$0	$0
4	$1,875,000	0.0%	$0	0.0%	$0	$0
5	$1,245,000	0.0%	$0	0.0%	$0	$0
6	($15,000)	0.0%	$0	0.0%	$0	$0
7	($960,000)	2.0%	$192,000	0.0%	$0	($192,000)
8	($1,275,000)	0.0%	$0	0.0%	$0	$0
9	($1,590,000)	0.0%	$0	0.0%	$0	$0
10	($4,740,000)	0.0%	$0	2.0%	$948,000	$948,000
Total	$3,000,000	2.0%	$192,000	2.0%	$948,000	$756,000

The business case benefits must also be calendarized so that actual benefits can be tracked against plan on a monthly and quarterly basis.

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Measuring the Benefits – Targeted Non-Renewals

#1   How many underwriter initiated non-renewals are occurring?

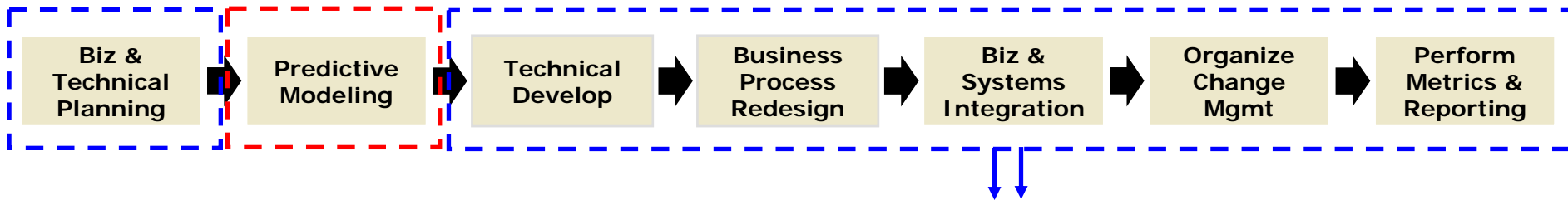**#2**   What is the score or decile of each non-renewal?

#3   What is the distribution of non-renewals by region, branch, underwriter, etc.

#4   Is the business process performing the business case defined actions required to achieve the estimated business benefit?

End-To-End Implementation – Making Models Come Alive

| Biz & Technical Planning | ▶ | Predictive Modeling | ▶ | Technical Develop | ▶ | Business Process Redesign | ▶ | Biz & Systems Integration | ▶ | Organize Change Mgmt | ▶ | Perform Metrics & Reporting |

- What systems modifications are required to accommodate the process?

- What will different people in different roles see throughout the process?

- How will predictive model results be disseminated throughout the organization?

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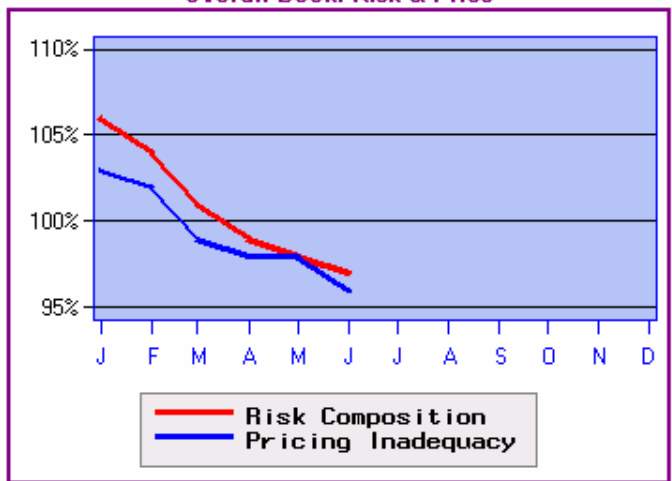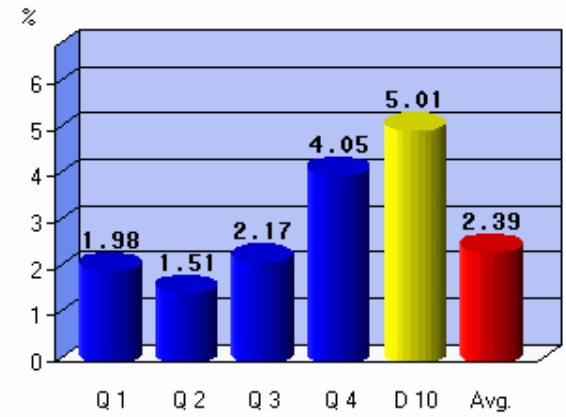
General Overview

- **Results Summary**

Executive

- **Summary**
- **Pricing Gap**
- **Loss Ratio Comparison**
- **Book Distribution**
- **Overall Book: Risk & Price**

Underwriting

Actuarial

Operations

Sales

Overall Book: Risk & Price

Risk Composition
Pricing Inadequacy

YTD Non-Renewals

Q1 1.98   Q2 1.51   Q3 2.17   Q4 4.05   D 10 5.01   Avg. 2.39

YTD Claim Frequency - Predicted vs Actual

Actual   Predicted
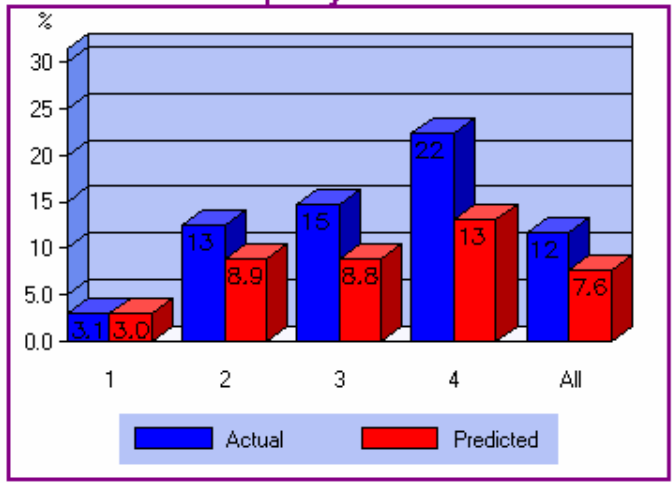
YTD Renewals Routed to Underwriting

Q1 8   Q2 28   Q3 57   Q4 84   D 10 84   Avg. 38
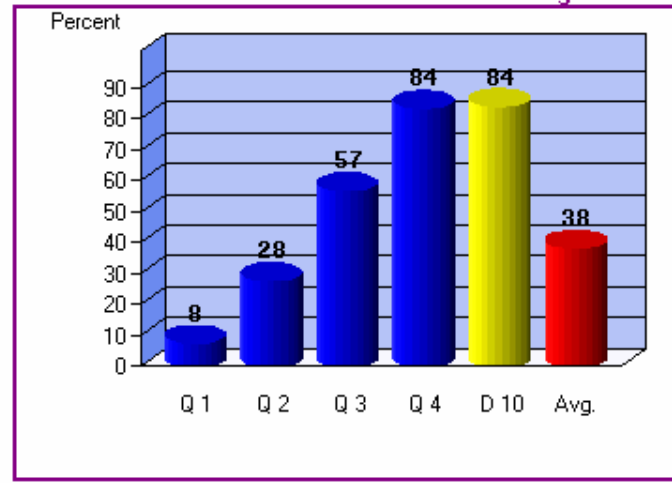
Profitable Growth

Policies   %

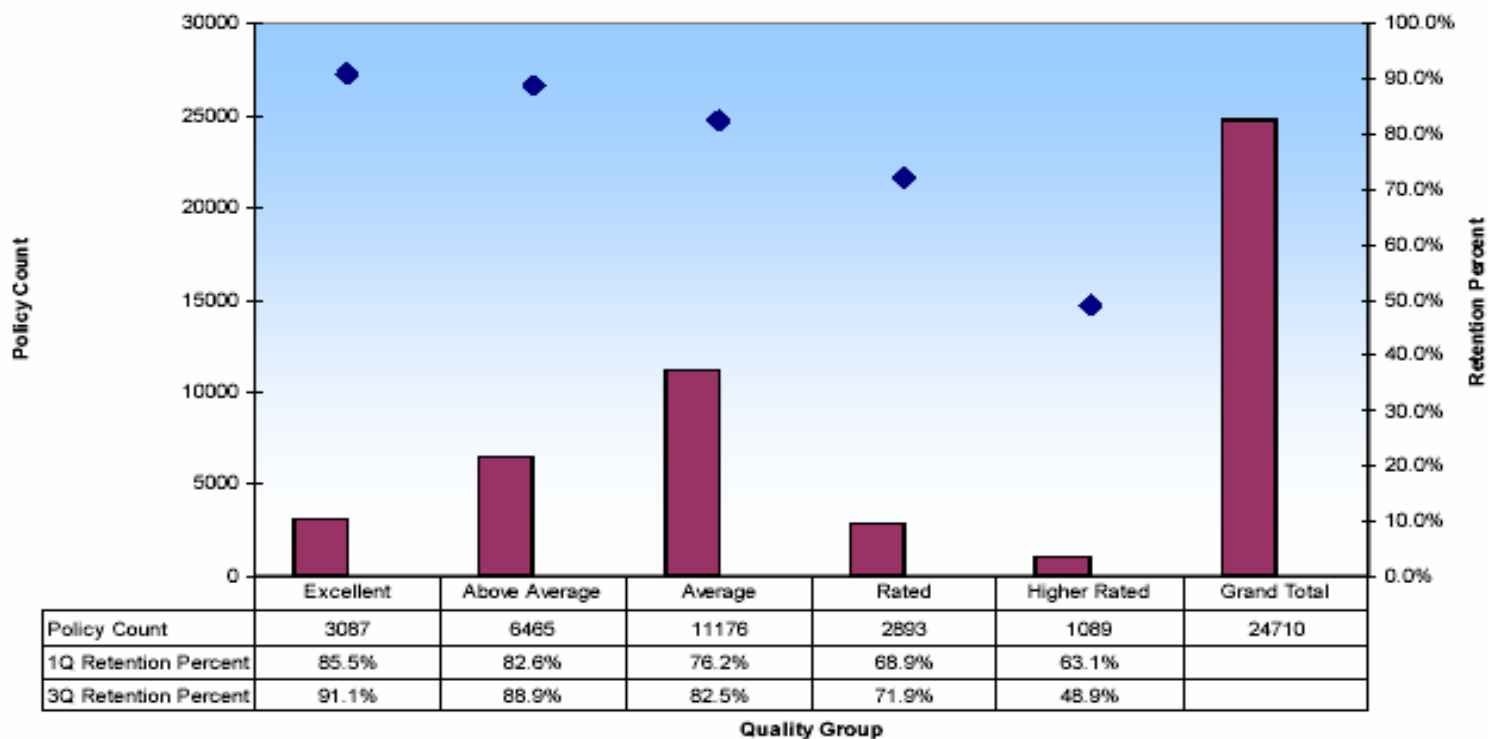Done   Local intranet

Measuring the Benefits – Best Practices

Exhibit 4: Retention of Best Business Is Greater

Retention of Best Business is Greater

Available to Renew by Quality Group BOP 3Q Expirations

	Excellent	Above Average	Average	Rated	Higher Rated	Grand Total
Policy Count	3087	6465	11176	2893	1089	24710
1Q Retention Percent	85.5%	82.6%	76.2%	68.9%	63.1%	
3Q Retention Percent	91.1%	88.9%	82.5%	71.9%	48.9%	

Quality Group

In Summary

#1 What is the business case dollars & cents justification for doing a predictive model?

#2 How will the baseline benefit be determined?

#3 How will actual benefits be measured on an ongoing basis and compared to the baseline estimation?

#4 If the overall loss ratio is deteriorating have the estimated business benefits still been realized and if so how can they be measured?

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