Underwriting Acceptance of Predictive Analytics Results

Christopher Cooksey, FCAS, MAAA, CSPA
Head Actuary, Data & Analytics
Guidewire Software

Jeff Beatty, CBIA
Underwriting Director
Builders Mutual Insurance Company

26 June 2018

Agenda

The Task in Front of Us
Approaching the Task – as an Actuary
Approaching the Task – as an Underwriter
Some Recommendations

Page 2

The Task in Front of Us

So you want to do Predictive Analytics…

Some pitfalls in thinking or attitude:

- **The Actuary/Modeler really just wants to build models. He or she is unconcerned of the process before or after that.**

- **The Executive thinks that Predictive Analytics (and Machine Learning in particular) can do anything and solve any problem, that it is, in effect, "magic".**

- **The Underwriter thinks that Predictive Analytics will put them out of business.**

- **IT thinks they'll have to program and maintain it all.**

Page 4

So you want to do Predictive Analytics…

Everyone needs to get past their preconceived notions.

- **The Actuary/Modeler needs to realize (reaffirm?) that they are part of a business. No one will pay them (for long) to do analytics unless the business benefits from it.**

For the Actuary, one reason they don't like to think about this is that they are often not in a position to make it happen.

Page 5

So you want to do Predictive Analytics…

Everyone needs to get past their preconceived notions.

- **The Executive needs to come to an understanding of what Predictive Analytics can and can't do, and the level of effort involved. This is often just a matter of familiarity.**

Coming to an understanding of the effort involved is typically constructive. Issues of cost/benefit and how to spend limited resources is their bread and butter. This takes it out of the realm of "magic".

Page 6

So you want to do Predictive Analytics…

Everyone needs to get past their preconceived notions.

- **The Underwriter needs to see PA as an effort to help them do their job better. Being antagonistic to the changes wrought by PA will only make it *more* likely they are put out of a job.**

Taking the initiative to partner with predictive modeling efforts will make sure that UW has the input needed to make a good process.

So you want to do Predictive Analytics…

Everyone needs to get past their preconceived notions.

- **IT needs to leverage cloud-based solutions. Most analytical platforms have some sort of API deployment.**

If you have one or two models, in-house IT can program and maintain them. If you want to be a data-driven company with many production models, cloud-hosting models becomes more and more necessary.

The Task in Front of Us

If it doesn't happen by magic, how does it happen?

Historically, the use case was Pricing, so teams of modelers originated in the Actuarial teams.

However, becoming a "data-driven company" means more than Pricing. So the scope *and skill set* of PA teams needs to be sufficiently broad.

The Task in Front of Us

Before putting in the effort of data collection and modeling, create a *complete* project plan.

One reason is to scope out the feasibility of your use case, both in terms of time and cost.

- **Data collection and modeling**
- **Delivery of model results**
- **Monitoring performance**
- **Maintenance going forward**

Page 10

The Task in Front of Us

Some steps and who's involved.

Task	Executive / Business Owner	Modeling Team	Business / End Users	IT
Decide on the use case	X	X		
Organize/Approve the Project Plan	X	X	X	X
Collect Data		X		X
Build Predictive Models		X		
Finalize Predictive Models (socialize and agree)		X	X	X
Make predictive information available to End User (change workflows)		X	X	X
Measure/Report on benefit of new workflows	X	X	X	
Monitor model performance		X		X
Model maintenance/refreshes over time		X		X

Page 11

Approaching the Task – as an Actuary

It would be lovely if…

…someone in your company has the knowledge and the vision, and the authority, and the budget, to drive the modeling efforts.

This mythical person drives the effort, and you, the Actuary, participate in an organized process that only requires you to do what you love to do – build the models.

It would be lovely if…

Let's assume instead that you're an actuary that would like to be part of this, but "this" isn't yet happening:

• Your company has little to no modeling endeavors.

• Your company has a modeling team (that you aren't on) and their focus is entirely pricing.

• You are on the modeling team, but your team's work languishes and never gets implemented.

What can you do?

What can you do?

Brainstorm…

What can you do?

Brainstorm…

• **Talk to people & network – both in and out of your company.**

• **Meet an underwriter. Talk to them.**

• **Know your contacts in IT. Who knows what's going on?**

• **Understand your corporate culture – are they open to what you want to do?**

• **Quantify the value of your ideas.**

The more realistic a picture you can paint for people the better. Can you make it seem like a manageable task?

Page 16

Approaching the Task – as an Underwriter

It would be lovely if…

…someone in your company has the knowledge and the vision, and the authority, and the budget, to drive the modeling efforts.

This mythical person drives the effort, and you, the Underwriter, participate in an organized process that doesn't end up causing you a whole lot of pain and wasted time.

Page 18

It would be lovely if…

Let's assume instead that you're an underwriter that would like to be part of this, but "this" isn't yet happening:

• **Your company has little to no modeling endeavors.**

• **There is a modeling team, but their focus is entirely on pricing.**

• **There is a modeling team that has UW projects, but their work seems to have little relationship to anything that you recognize.**

What can you do?

What can you do?

Brainstorm…

What can you do?

Brainstorm…

• **Talk to people & network – both in and out of your company.**

• **Meet an actuary. Make a friend.**

• **Do you know anyone in IT? Who's responsible for the screens you work on?**

• **If possible, learn about predictive modeling (not the hype).**

Come up with ways you think predictive modeling might help your job. You don't have to be right; just help start the conversation.
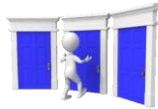
Some Recommendations

Some approaches we've seen work

Pick a project. Don't try to boil the ocean.

- Find a use case with concrete benefits that requires a model that can be built.
- See this one use case through to implementation and beyond.
- Quantify and socialize the benefits.
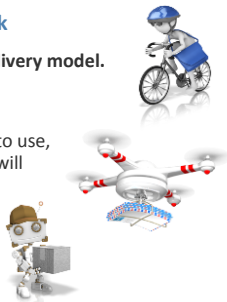- Use this to justify the next project.

Some approaches we've seen work

Do not skimp on understanding the delivery model.

- Who is the end user?
- Are they expecting to get, and willing to use, the information the predictive model will be providing?
- Is the information delivered in a way they can use?
  Make it consumer-friendly.

Some approaches we've seen work

Set up feedback loops throughout the process…

Before beginning, get feedback from the end users, not just the business owners.

- Understand their problem and how the model will help.
- Set expectations of what the model will and won't do.
- Get ideas on what the users do and how they do it.
- What do they think will be predictive and not?
- Are there any fatal flaws?

Some approaches we've seen work

Set up feedback loops throughout the process…

During the modeling, communicate working versions of the model with the business and IT.

- Does the model discriminate enough to improve the business?
- Are the false positive/negative rates acceptable, or will this torpedo acceptance of the model?
- Is the model output in the form the user was expecting?
- Does the model use inputs that IT will find difficult or impossible to gather for production use of the model?

Some approaches we've seen work

Set up feedback loops throughout the process…

During implementation, be involved. Communicate with IT and the end users.

- Is the model output in the form the user was expecting?
- Consider a pilot roll-out with the end users who have been involved.
- Should a pilot be used to get A-B tests to quantify benefits?
- Does production data look like the data used to build the model, or have distributions changed?

Some approaches we've seen work

Set up feedback loops throughout the process...

After implementation, collect info on usage and impact
- Make sure model predictions are saved.
- Monitor the data used as inputs – does it match what you modeled?
- If the predictive information is supposed to change behavior, can that be quantified?

Some approaches we've seen work

From the beginning, set the expectation that this is a process, not a one-time effort.
- This is true *for the given use case*, not just PA in general.
- You *will* learn things that, in some abstract sense, "should" have been known before. This is *part* of the process.
- Commitment to this use case is not only in setting up the model, but in maintaining it over time.
- The efforts shift and change, but you can't just say "it's done" and leave a model behind.

Summary

- **Everyone under-estimates the effort of doing PA right. Quantifying the full effort makes PA more realistic for everyone.**
- **Foster in yourself and others a realistic understanding of what PA can and can't do.**
- **Work to get high-level ownership and multi-disciplinary teams.**
- **See projects through to a realized, concrete benefit. Measure and socialize this benefit.**
- **Have a plan for maintaining and updating production models over time.**

Questions?

Christopher Cooksey, FCAS, MAAA, CSPA
Head Actuary, Data and Analytics
Guidewire Software
ccooksey@guidewire.com

Jeff Beatty, CBIA
Underwriting Director
Builders Mutual Insurance Company
jbeatty@bmico.com

Page 11