RECORD, Volume 28, No. 3*

Boston Annual Meeting
October 27–30, 2002

Session 134PD
Automated Underwriting: Panacea or Pandora's Box?

Track: Computer Science

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Panelists: ALAN J. HOBBS
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Summary: Several companies have shattered the myth that life insurance underwriting is too complicated to ever be automated. OK, the concept is now feasible, but is it really a sound business practice? The Internet, the very medium that brings great potential for reaching large numbers of applicants at low cost, can also support chat rooms to advise thousands of impaired risk applicants on how to get approved on your system. Panelists discuss pricing issues, patent issues, safeguards, successes, failures and observations about the future of automated underwriting.

MR. TOM RIEHM: My background is underwriting. I know that may be a little unusual for your meeting, but since we're talking about an automated underwriting system, I thought it might be worthwhile when Dave invited me to attend. My training, in addition to individual underwriting and reinsurance underwriting, also involved a stint in research and development (R&D). While with Lincoln Re, we developed our underwriting manual and did a lot of studies in R&D.

Later, as Lincoln Re began developing its underwriting system, the Life Underwriting System (LUS), our R&D area was asked if we would spend some time helping to embed the knowledge that goes into that system. So part of my team's responsibility in underwriting R&D was to help develop the knowledge behind LUS. More recently, beginning in 1996, Lincoln Re decided that it wanted to go in to do some outsourced underwriting and underwriting for other companies. I was asked

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to head up that process and I continue with that today. But as part of that process, I moved from the development side to a user side of some of the technologies. It's that experience that I bring today, and it was with that background that Dave invited me to attend. Hopefully, I can share with you some things that we've learned over the course of the last few years.

MR. ALAN J. HOBBS: For the last five years, I've been heading up the automated underwriting area at RGA. I've got some live experiences that I can share with you.

MR. WILLIAM R. WELLNITZ: I'm from Transamerica Reinsurance. Unlike these two gentlemen, I've had absolutely no hands-on experience with automated underwriting at all. I will take a look at those companies that Transamerica Reinsurance is familiar with that are using automated underwriting and find out some of the things that have been important to their successful implementation of the technology of the approach. The view I'm going to bring is a "lessons learned" commentary.

MR. DAVID L. SNELL: Gentlemen, that tells us a little bit about your background, but it doesn't tell us why we even care about automated underwriting.

MR. HOBBS: There was a study done and produced by Life Office Management Association (LOMA) last year called the Individual Life Insurance Service Turnaround Survey . It evaluates many of the underwriting, new-business policy and service functions. Figure 1 shows some statistics I'd like to share with you from that study. You hear that the U.S. life insurance industry is only selling to the higher-income market. Statistics show that the U.S. industry has not completely abandoned the smaller face amount in that market. Over half of all U.S. life insurance applications are for $110,000 or less. You also find that 78 percent of all applicants are finally rated "standard" or better? a pretty healthy group of people. Despite the fact that we look at lots of small policies and generally it's a healthy group of people, you find that 86 percent of all applications are actually reviewed by a human being? by an underwriter? before the decision is finally made. Finally, you also see, which is one of the more shocking statistics to me, on average, beginning as low as $16,000 face amount policies, the industry is actually having human underwriters review cases before making final decisions on the cases.

Figure 1

US Life Ins Industry Statistics

Source: LOMA Individual Life Insurance Service Turnaround Survey 2001 Report

- 53% of applications are for less than $110,000
- 78% of applications are classified as standard or better
- 86% of applications go to an underwriter
- $16,000 is the average minimum face amount reviewed by an underwriter

You've also heard this kind of statistic in different formats before. LOMA says that it takes 42 days from the time somebody decides he or she wants to buy life insurance and wants to pay a premium to us as direct writers and reinsurers, until the time we actually finish the process and get all the final paperwork back. Forty-two days. The smaller typeset found on Figure 2 shows you how that breaks out. A great deal of that is getting the application to the home office, doing the underwriting evaluation and making an offer. Also, the number of underwriters that are available to underwrite these cases is either flat or it's actually declining.

Figure 2

US Life Ins Industry Statistics

Source: LOMA Individual Life Insurance Service Turnaround Survey 2001 Report

- Average of 42 total days – from application date to receipt of all delivery requirements
  - 5 days – getting the application to the home office
  - 2 days – beginning to review the case once the application is received
  - 16 days - waiting to get all underwriting requirements
  - 3 days – making an underwriting offer once the last requirement is received
  - 6 days – getting acceptance of the offer and placing the policy in force
  - 1 ½ days – generating a policy once the underwriting offer made
  - 1 ½ days – mailing the policy to the distributor
  - 16 days – obtaining all of the delivery requirements

The U.S. industry is also grappling with a number of issues. We are grappling with meeting margins. We are grappling with meeting expense margins. There has been a great deal of work done, in the last five or ten years, comparing what our actual expenses are with what we have assumed for pricing purposes. There's more than one company in the room that has found that it may be spending a couple more dollars than it is actually including in their pricing.

We also find, as we are finding pressure to develop competitive products, that we also have to address the mortality margins. We're pushed to project aggressive mortality assumptions but at the end of the day, we're seeing that our results at times are not consistent with the pricing. We're also seeing that we are selling to a population that is increasingly mobile. People want to buy at different times, whenever they're ready. We're also seeing that the ethnic make-up of the U.S. population, which we are selling into the midst of, is changing and growing very rapidly.

MR. SNELL: Let's get back to basics here. What is automated underwriting?

MR. RIEHM: To condense this as concisely as possible, I define it as hardware, software and process used in evaluating a potentially insurable risk. That's a relatively short definition, but there's a lot that goes into developing that. For those companies who haven't gotten into this, it's quite a challenge, and that's one of the reasons that we're here.

MR. HOBBS: I've defined automated underwriting as automating one or more

portions of the underwriting process, whether that's collecting the data, evaluating the underwriting data, or making a decision as a result of the information that's been collected. I think it helps to have that broader definition as you consider automated underwriting.

I want to give you some examples of what I would classify as automated underwriting. The first one is automating an underwriting process? a six-question pass/fail underwriting process? from beginning to end. You collect all the information on the applicant and then make an underwriting decision when you're finished? on everybody. That's a classic definition of automated underwriting. But if you stop there, I think you've missed a great deal of the power of automated underwriting. I would define automated underwriting as including automating the interpretation of lab feeds. Interpretation of data that we get back from labs can very easily be automated. I would also classify automated underwriting as including identifying non-preferred lives. As people apply for insurance with all of you, many people will only ultimately buy the case if they are "preferred." Through the use of automated tools, you can actually identify, early in the process, if a particular applicant is not going to be "preferred."

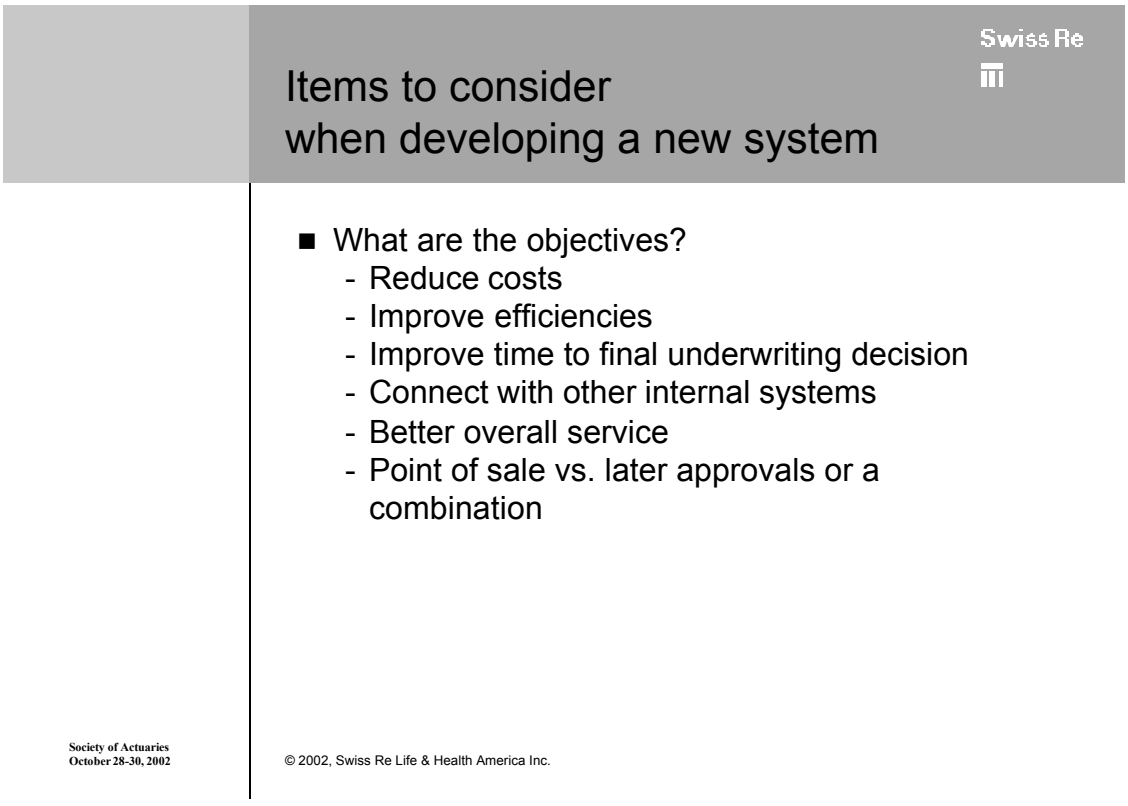
There is also something called "alternative underwriting," that I call a close cousin of automated underwriting. As you're considering this topic, you need to consider all of it in context. Some of this is actually being done because of automated underwriting tools. The dreaded "attending physician's statement" (APS) is one of those tried-and-true tools that underwriters have used. Companies are increasingly finding that in many cases they can replace that tool through the use of telephone questionnaires for selected impairments. They get as good, or maybe even better, results faster and less expensively. There's the ability to electronically get at pharmacy data very, very quickly. A lot of companies have been looking for other ways to get fluids, ways which are less invasive and faster. The substitution of saliva for either blood or urine is one of those things that I would classify as alternative underwriting. Lastly, there's the use of motor vehicle records (MVR). Most states, almost 100 percent, now have MVRs available electronically. Many companies are beginning to use electronic gathering of MVRs to get information to evaluate the accidental-death risk.

What are some of the characteristics of automated underwriting? I would classify automated underwriting as something that's available "24/7," consistent with what people are expecting today. Automated underwriting allows underwriting to be done at more than one place at a time. To deal with the fact that there is either a flat or a declining number of underwriters, automated underwriting tools allow non-underwriting people to do some underwriting. Automated underwriting also allows you to be able to underwrite in multiple languages? such as English, Spanish, or Chinese? as the ethnic population in the United States continues to grow.

MR. SNELL: What if I wanted to set up an automated underwriting system? What characteristics would I be looking for?

MR. RIEHM: Figure 3 gives an overview of some of the things that you need to look for. First of all, one of the things that is critical in the process, is to think through and identify your objectives. What are your goals of this system? Sometimes marketing folks come to me and they say they want the simplest system, the shortest number of application questions, they don't want to get underwriting requirements, they don't want underwriters involved, but they want the lowest price and also the best mortality on the street. I tell them that that's a grand plan, but they aren't going to get there unless they really think through a lot of the things that are very important. They need to think about whether they want to improve efficiencies, reduce cost or improve the time to that underwriting decision. As Alan mentioned earlier, there are a lot of components along the way that can help you achieve that, but they are very important to think through. It makes a difference if you want to go point of sale, to try to do things immediately, or if you want to do later approvals, where data is collected? sort of a fully underwritten model? and it comes back to you.

Figure 3

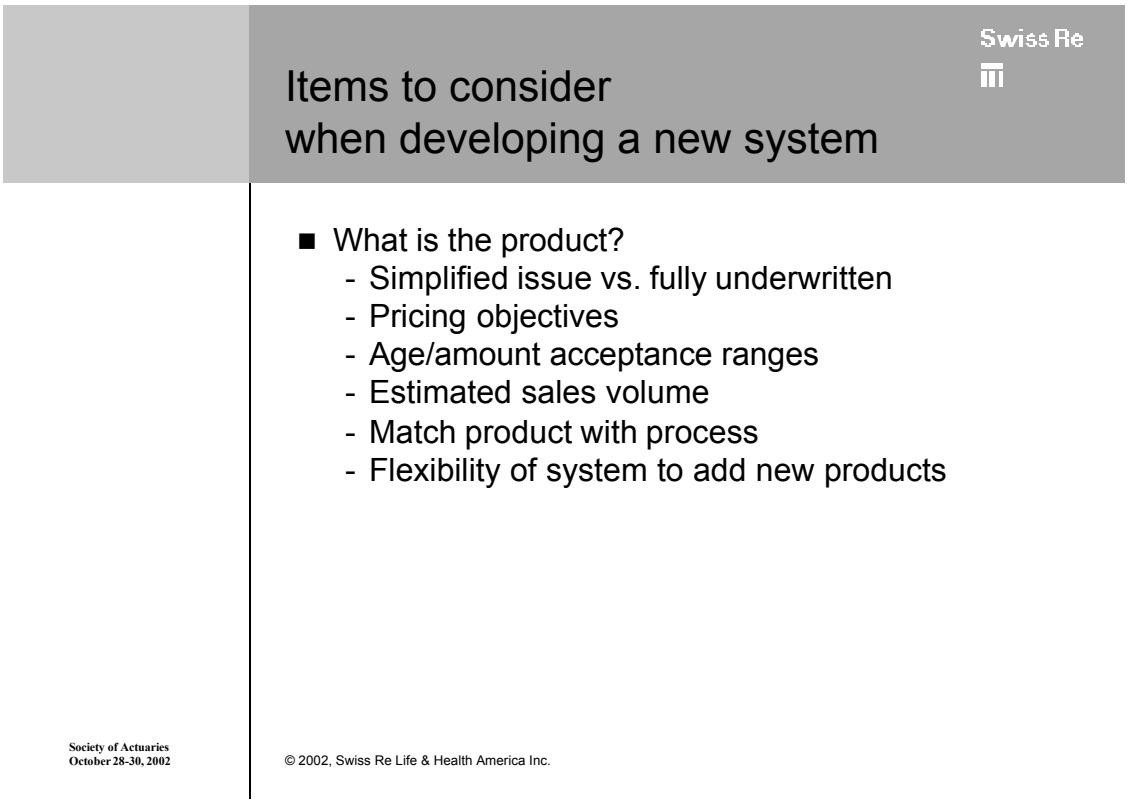


MR. WELLNITZ: As Tom said, the key here is to start off by thinking what you're trying to accomplish with an automated underwriting system. There are two major categories you can place this in? strategic or tactical. By strategic, I mean it's part of a multi-faceted plan on how you're going to enhance your company's performance. By tactical, I mean you are looking at specific issues and specific problems that you're trying to address.

Now, in talking with a number of our clients, we found that the strategic positioning? not surprisingly? leads to a better success and to larger benefits realized, in large part because clients found that they had improved senior management commitment. Senior management sees this as a critical piece affecting the company's performance. The risk-selection efforts are integrated with and supporting the objectives of the whole business model. It isn't just an add-on or just something being done in the back office. Finally, you end up with the resource attention necessary to keep the system current and tuned up. One of the things that a number of companies commented on is that this isn't just "plug and play." This is something that's going to require routine, ongoing tweaking? not so much maintenance? to keep the whole automated underwriting system tuned up and working well within the whole business model.

MR. RIEHM: As shown in Figure 4, there are some other items to consider. A lot of times, in talking with customers, we find that people try to take their current product and develop and wrap around the technology to make that work. Sometimes it works okay, but often it doesn't. You really have to think about what that product is, what your pricing objectives are, whether you're going to do simplified underwriting or full underwriting and what your sales estimates are. The type of technology that you bring to the forefront will depend upon what your expectations are with respect to products.

Figure 4



You also need to think about how the product is sold. Are you selling it via your agency system? Do you want to sell it on the Internet? Are you going to use your own Internet site? Are you going to use an aggregator's site? Are you going to try to sell it using a call center? The way that you collect information and the way that data comes into the system are real important. You want to make sure that you're collecting data, not necessarily things that cause an exception processing to kick it out. You want to coordinate all that activity.

MR. WELLNITZ: You need to know what you're trying to achieve with your business model. Once you know what you're trying to achieve, you need to make sure that you have alignment among all aspects of the customer acquisition chain. There are critical pieces. Who are you selling to? What's your value proposition? Lastly, how are you intending to reach your customer?

But beyond this alignment, you have to think about what you're trying to achieve with the automated underwriting system. Is it a point-of-sale filter (I'll talk more about that later), or is it a risk-assessment tool? Are you trying to improve the ease of doing business, or are you trying to compete effectively in a commodity market, either by faster turn-arounds or lower costs?

MR. RIEHM: It wouldn't be complete if, with my background, I didn't talk about

some of the underwriting considerations. When you're developing a system, you have to think about the knowledge that you need to build into it, how it needs to be developed, what kinds of things are important, how you are going to drill down, do you even want to drill down on some things. You can look at examples. If you've got a fully underwritten model where you're really trying to get APSs and you do all the traditional types of underwriting mechanisms, the way that you ask questions and when you ask them are really critical. Are the underwriting requirements traditional requirements, or are there some non-traditional things, like pharmacy data? You may be able to collect it electronically, but what happens when it comes into the system.

MR. WELLNITZ: In talking with our customers, what I have distilled is that this issue of matching the underwriting tool with the business model resulted in two major types of applications. One is what I refer to as the "filter," and the second is the risk-assessment tool. By filter, I mean that you use the technology to screen or categorize applicants based solely on what the applicant tells you. You're not looking for any other kinds of external information. When you use the technology in this fashion, there are some important considerations, as you see on Figure 5. First, there's the reliability of the information that you're being given. You have to remember that it is just the applicant that you're relying on. Another consideration is the ability of the applicants to fully understand, without guidance, the questions that are being asked. You're talking about a situation where the applicant is likely to be sitting there alone, perhaps with an untrained advisor, and the questions that are being asked need to be understood by the applicant. You need to consider a balance between brevity and completeness. You can't have the application, or the series of questions, go on so long that the applicant just gives up. On the other hand, you can't leave with gathering too little information, or else the filter isn't going to bring you to the right spot. You also have to consider what you are going to do with rejected applications. If you reach the end of the filtering process and this is a risk that you have some concerns about, how are you going to deal with that? You can simply decline the case, or you could offer to put it into a more extensive underwriting process. You need to think what you're going to do about this because you're talking about how the applicant is going to feel about how you handle him or her, how the distributor is going to feel about how you handle people in this category, and you have the expense, time and everything wrapped around how much revenue these cases are likely to produce in the end result. You can't underestimate the importance of how you deal with the outliers here. I'll use the example of banks. The last thing a bank wants to hear is that one of its valued customers was just told "No, we can't handle your policy."

Figure 5

Automated Underwriting - Lessons Learned

Filter

- Considerations
  - Reliability of the information provided
  - Ability of the applicants to fully understand the questions asked without guidance
  - Balance between brevity and completeness
  - What to do with rejected applications
  - How to establish appropriate mortality assumptions
  - How to control anti-selection exposure
  - Technology infrastructure and IT support

Beyond that, there's the question of how you establish appropriate mortality assumptions for this environment. That has a lot to do with how you intend to control your anti-selection. Some of the techniques involve limiting the maximum face amount. Once again, you have to consider what your whole-business model is. If the market you're intending to attract here would ordinarily buy $500,000 policies and you set the program up for a face-amount limit of $200,000, you have a clear mismatch. You could target your distribution outlets where the applicants are not interested in *just* purchasing insurance. That's a key earning. If people are coming to your source *just* because they're interested in insurance, they're more likely to be in a situation where they're going to do what it takes to get your policy. You want to monitor repeat applications so that you can determine individuals that are trying to infer your guidelines, infer your decision set based on how they answer questions and what happens to them at the outcome. Last, you'll want to prepare for and actually conduct tough claim reviews, so that you understand how your system is being used against you.

Another key area has to do with technology infrastructure and your information technology (IT) support. The automated underwriting, or this filtering process, doesn't necessarily require that you use Web-based tools, although that certainly is one approach. You can do this all on paper. You can use it through a remote software installation, a remote network dial-in or you can use the Internet. There are many ways you can set up the filtering mechanism. One of the most important issues with this is content maintenance. How are you going to make sure that what the applicant is seeing and responding to is what you currently expect them to

respond to? You have to think about data capture and transmission. A major stumbling block for a number of our customers was how this data was coming in and how it was going to be sent into a central location? both the technology involved and the security of the information that was being passed through.

If you are going to use this as a risk-assessment tool, there are some rather different considerations. Here, your system is going to evaluate the data and actually arrive at a risk assessment. It is really important that it matches your business model because you have a choice here of trying to either eliminate the need for manual underwriting, or to maximize the efficiency of your underwriting staff. This is an important differentiator here. You end up trying to decide whether the system is the main driver and you're going to have people on the edges that are going to support the system, or whether you're going to have a system that you can use to support your underwriting professionals.

Figure 6 shows some of your considerations. One is where the data is coming from; the applicant is by himself or by herself. Here, you may actually still have your producers in the loop. You may use a tele-interview process. You certainly will still have parameds in the picture, as well as your labs supplying you data. Your parameds could be used not only for gathering the typical medical information, but could also be used for some of the interview questions. But as we've heard in other sessions, it's important to figure out how you're going to use the parameds in a focused context within your risk-decision model.

Another key question? who is going to order the requirements? The technology that's available today can mechanize this process for you if that's what fits your overall business model. There are many producers and producer groups that will fight you tooth-and-nail to let the home office take control over requirements ordering. If you try to do this just as an underwriting step, you're going to blow up. You can't address this as underwriting; you have to take a look at what you're trying to achieve in your whole business model. It's absolutely critical if you're going to be successful with this. A number of companies have commented that they've enjoyed immense cost savings, as well as acceleration of the process, just by getting control of requirements ordering. But that's not something that you can do as a "one off" sort of thing; it's going to require a total commitment.

Figure 6

Automated Underwriting - Lessons Learned

Risk assessment tool

- Considerations
  - Where is the data coming from
  - Who is ordering the requirements
  - How is the data getting into the system
  - Complexity of the system
  - What to do with applications that the system cannot handle
  - How to control anti-selection exposure
  - Technology infrastructure and IT support

How is your data getting into your system? Are your parameds and your labs prepared to supply data electronically? There are big problems with trying to get information like APSs, electrocardiograms (ECGs) and inspection reports electronically into your system. Unless that information gets in electronically, it's going to be very difficult for you to build a system that's going to be able to interpret that for you. Companies say they'll just re-key this data. Re-keying is a major issue. Even if you have people who are properly motivated to get this stuff right, you're still going to have problems with accuracy and delays. Some companies are trying to use optical character recognition (OCR) technology with image-based systems to translate their data. For high-quality images, the technology is getting pretty darn good. But when you're dealing with second-level faxes, copies of copies or handwriting, the thing just slows to a crawl. When you're considering how you're building your system and what you expect it to do, don't forget about how the data is going to get in, because it can bring the thing to its knees.

Consider the complexity of the system. Are you trying to use the system to replace as much as possible the need for manual underwriting? If you expect the system to run on a "lights-out" basis, you have to build in increasing levels of complexity into the decision model for the system. You need to balance this complexity against the overall business objectives, so that you don't end up spending too much of your resources in trying to get just this one piece of the overall business model to work right.

Around all of this, you'll need to continue to monitor how the system is working once you get it installed. You're going to have to continually take a look at how the system is being used. If it's not living up to the expectations, you have to pay attention to what the outliers are and how to bring those back into tune. That means that your system has to be flexible enough to permit modification and ideally, to permit modification by the users, as opposed to having to run this back to your technology staff to have it reset the system requirements.

We have the same issue with filtering and what to do with the applications the system can't handle. In this sort of environment, where you're looking for an actual risk decision, the distributor issues and the producer concerns about how the decisions are going to come out are much larger than they would be if it was just a filtering approach. In some markets, you can just say "No," but I think that's likely to be an issue in most places where you're going to try to write the business.

Think about exceptions. Are exceptions going to be the norm, meaning, is your system going to handle the 75 percent or 80 percent of the cases that ordinarily come through clean and straight and the other 25 percent or 20 percent of your cases are intended to go to one of your underwriters? Or are exceptions going to be truly exceptions, and you have to figure out how to get the right information to a professional to do that review? Anti-selection controls are key, and once again you have technology considerations.

MR. RIEHM: Over the development of the LUS, we went from a mainframe system, to C programming language, then we went to OS/2 and then we got into some artificial intelligence technologies? it becomes a challenge. That's what you're going to find as you go through this. What technology and what platforms should I use if I'm going to develop this system? What are its capabilities and what are its limitations? It becomes very important.

One of the things that is critical is connectivity. Typically, companies have up-front systems that they've had for a long time where they can collect information. You don't want to "double collect" that information. As Bill was saying, you don't want to rekey stuff. But if you get it in electronically, you have this underwriting, this knowledge worker in the middle, and we've sort of surrounded that. We've got technology at the back end and we've got technology at the front end, but in the middle we don't have anything. What these systems do, if nothing else, is connect to both the front end and the back end and help you develop efficiencies.

Another issue of importance is working with your vendors or your partners. One of the things that you want to think about, and you need to investigate if you're out there, is what vendors you are going to need to help you complete this process. Medical Information Bureau (MIB) is a classic. What if you want to bring in pharmacy data? How do you do that? How do you evaluate it? What about inspection reports? They aren't necessarily easy. You may be able to bring them in electronically, but you may not be able to process them electronically.

There are lots of things that you need to do. The vendors and the requirement providers for the insurance industry have not been out there sitting still; they're out there doing the same kinds of things. They've been developing information and systems as well, because they want to sell you their systems so that you integrate to those? and you may be able to. Make sure that you investigate what the vendors have and what you want to accomplish. They may be able to provide you with the information.

MR. WELLNITZ: The issue of buying or building the system, shown on Figure 7, is an early one and an important one, but it's not necessarily an easy one. There certainly is no one right answer. A lot of it has to do with your own assessment of whether or not your company is good at building and maintaining systems. My company, some years ago, had to admit to itself that it was not a software development company. The challenges of, in particular, maintaining the systems, were so large that we were much better served in finding off-the-shelf software wherever possible. Other companies can deal with that. When you consider how complex the system needs to be in order to fit your business model, you think about how soon you need it.

Figure 7

Automated Underwriting - Lessons Learned

Do you build or buy the system

- No one right answer
- How good is your company at building and maintaining systems
- How complex will the system need to be to fit the business model
- How soon do you need it
- Patent issues
- Value drivers for the cost-benefit analysis

Patent issues are something that you have to consider in this area of cutting-edge technology. There are a number of different layers here where companies are investing monies to develop technologies. They're interested in protecting their investments, whether they have to do with data communication or with prescription drug data. If you're out there and you're developing what you think to be interesting ways to access data, you need to make sure that you aren't simply traveling the road that someone else has already been down and that someone has captured the value of that idea.

Let's talk about value drivers for cost-benefit analysis. A number of us always have to do these cost-benefit analyses. Companies I talked to pointed to consistency of underwriting decisions, reduction in risk-assessment errors, improvement in not-taken rates and audit trails for underwriting exceptions. Audit trails are the ones that I found particularly interesting. People commented that audit trails gave them an opportunity to get real, actionable data on markets, producers, as well as underwriters, on decisions that were falling outside of the normal expectations. Another value driver is report, statistics and data in electronic form. The final value driver is scalability, to improve the through-put on a case level without having to worry about necessarily adding staff at the same rate.

MR. SNELL: There certainly are a lot of considerations in setting up an automated underwriting system, but I don't think you've told us all about those yet. You mentioned drill-down or reflexive questions. Can you tell us more about those and give us an example?

MR. RIEHM: Let's say that you're out there developing a product and you want to do a simplified-issue product. You want to say, "I want to accept this application." or "I want to reject this application." Maybe it's a bank market. You want to build in some tolerances in the underwriting, into the mortality, so you'll allow the underwriters to take risks that are up to maybe three tables of mortality. So you build that into your product and into the design. Then you throw it over to your knowledge workers and you say, "All right. Design those questions." What are the types of things that they need to do?

Here's an example. As an underwriter, I know I can go up to three tables. How do I start to develop these things? I look in my underwriting manual. What are impairments that sort of fit within that three-table range, to begin with, and then what sort of questions do I need to ask? One example is asthma, as I've illustrated on Figures 8 and 9. Asthma is one of those conditions where it can be very insignificant or it can be very severe. From an underwriting process, you're interested in trying to decide whether or not you can accept this. You might design a question in a simplified underwriting manual or model where you don't have to get too deep into it. All I'm trying to do is decide whether I can put this person in or take this person out. I put some questions together. If someone says "yes" to asthma, out come a couple of drilldown questions. "Have you been hospitalized for asthma in the past five years?" might be one question. My underwriting manual

says if the person hasn't been hospitalized, it's probably no worse than a moderate level of asthma. "In the past month, have you taken oral steroid medication?" Again, that's one of those things right out of the underwriting manual. Oral steroids tend to indicate a person has a relatively severe condition. Just by building in these two questions with "yes" or "no" answers, not trying to go too far, if you say "no" and "no," you're in. If there's a "yes" answer, that person is out. That's essentially what we're saying.

Figure 8

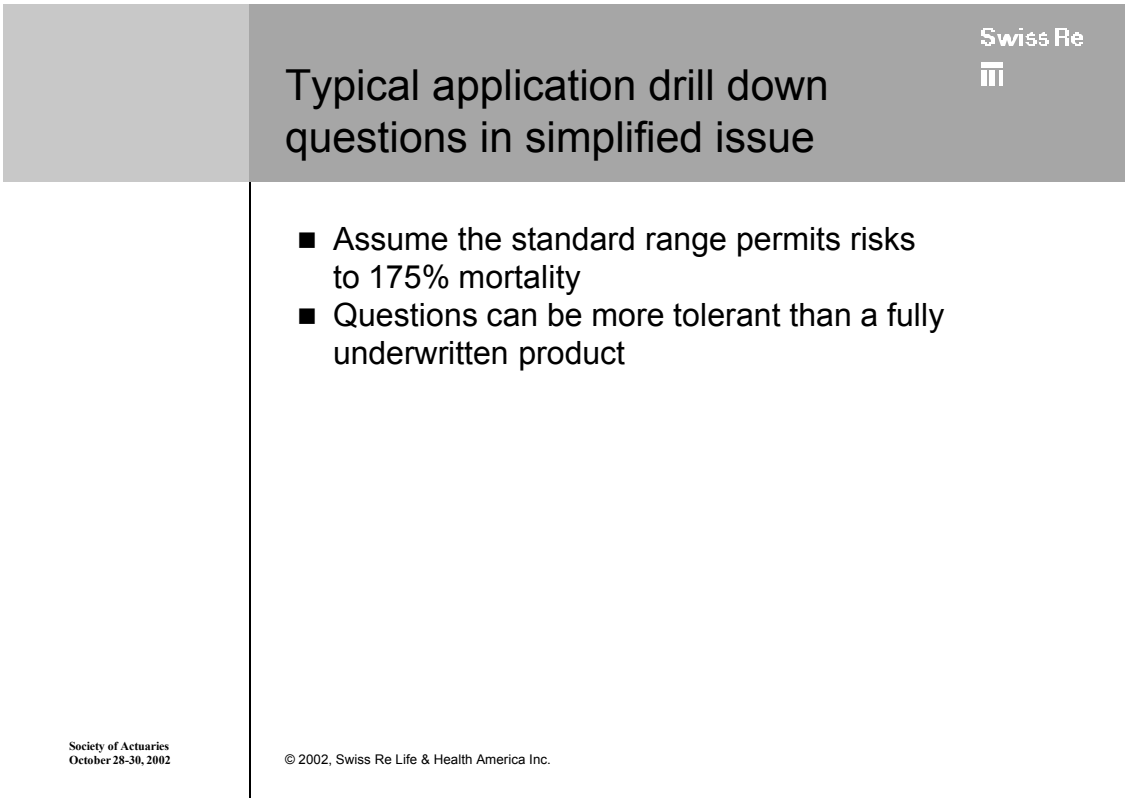
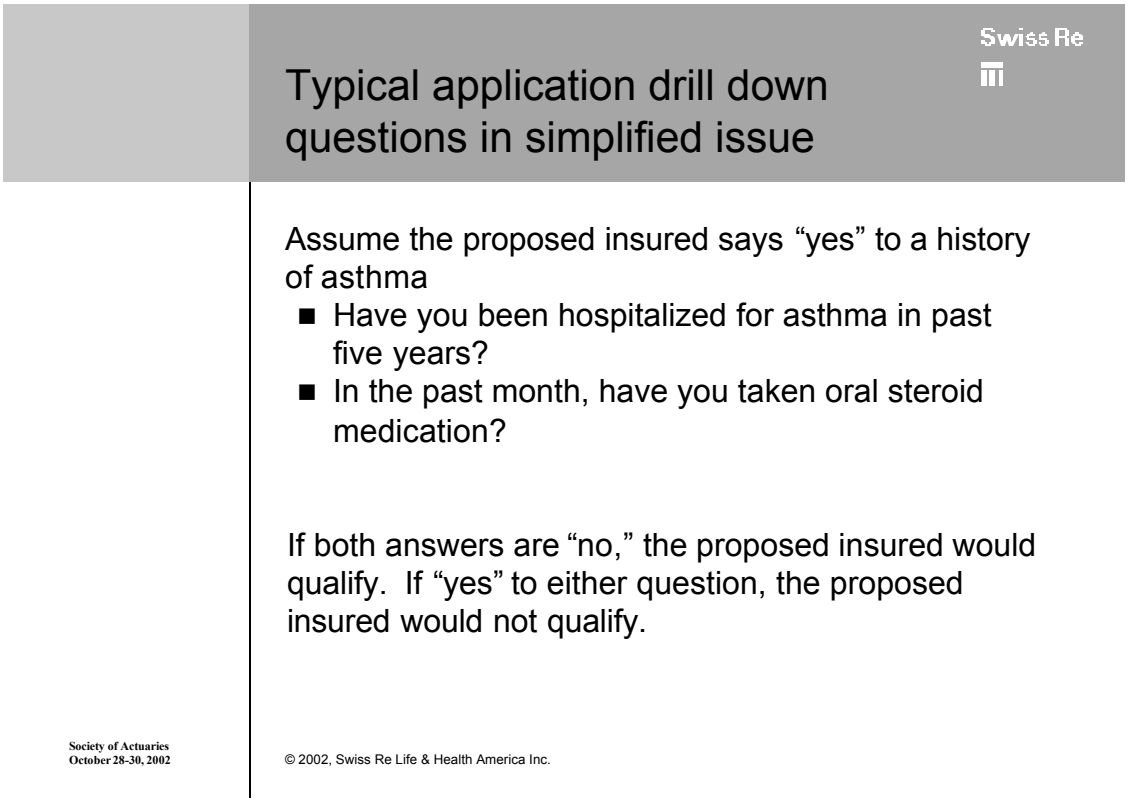


Figure 9



Let's take a fully underwritten model, shown in Figures 10 and 11. As a product development actuary, you're saying you can't allow people to go beyond that 100 percent standard. Now the underwriters, when they're developing this question for asthma, have to be more stringent and more refined in what they're doing. So here's how one might design a series of questions to go along with that. If someone says "yes" to asthma, now I'm interested in if you have *ever* been hospitalized for asthma, not just in the past five years, I'm no longer interested in accepting people who have moderate disease: I'm interested in people who have minimal disease or a very mild case. "In the past five years, have you used oral steroid medication?" Remember, in the other question it was "the past month." It becomes very important how you ask these questions.

You have to start with the underwriting manual as your base quote. What are you trying to accomplish? Then I throw in a few other questions, some of which are qualifying questions. "Do you think your asthma is getting worse?" There's a little danger in asking that because you're asking the person to make a judgment and you'd just as soon not do that, but it may be useful to you. People who are being honest will tell you if their disease is getting worse or it's not. That's just an example of how you would develop questions for fully underwritten models with 100 percent mortality expectations. A "yes" answer probably refers the person to an underwriter. You aren't going to decline this person, but you're probably going

to refer the person to an underwriter. If there are all "no" answers, the problem becomes trivial. It now fits my definition of what a "trivial" impairment is, like flu or cold.

Figure 10

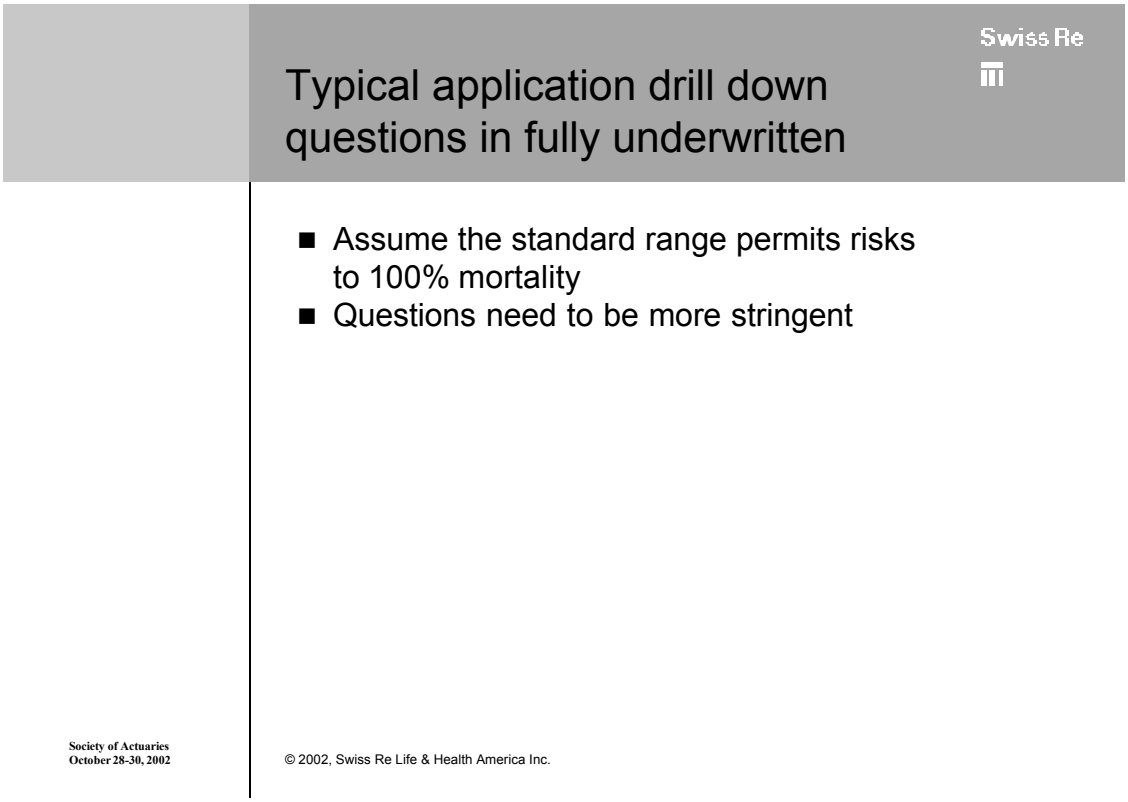
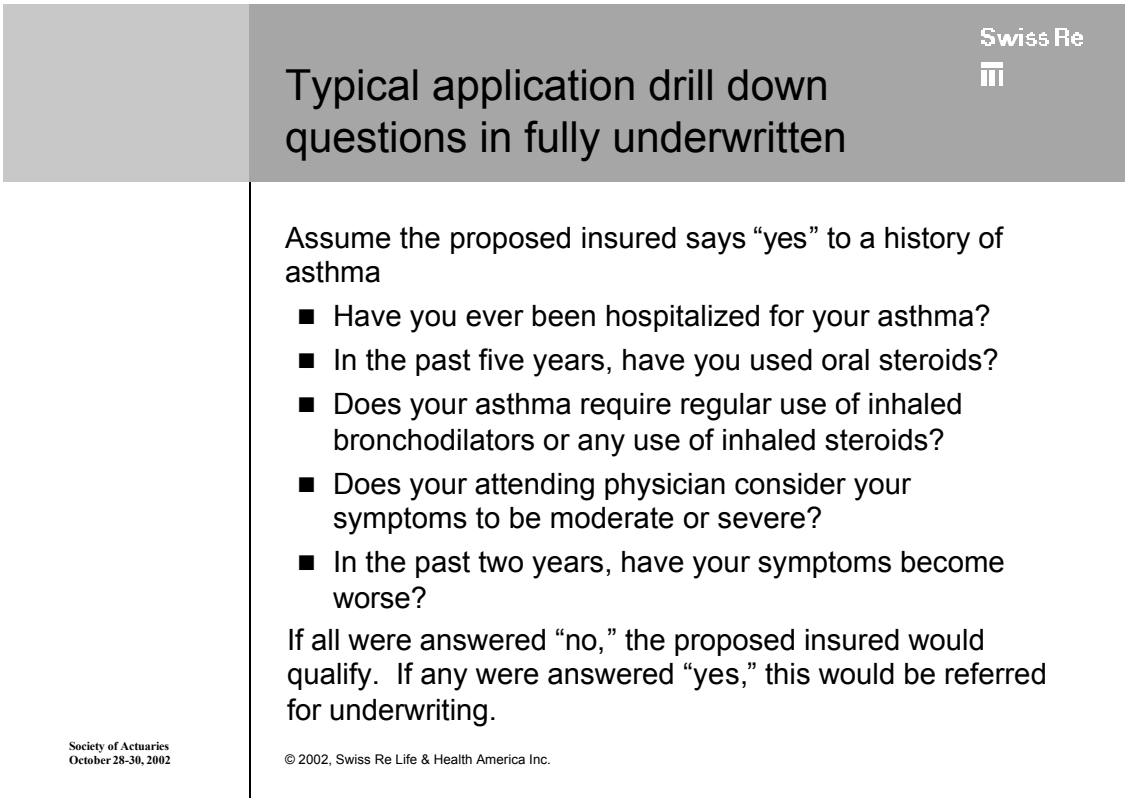
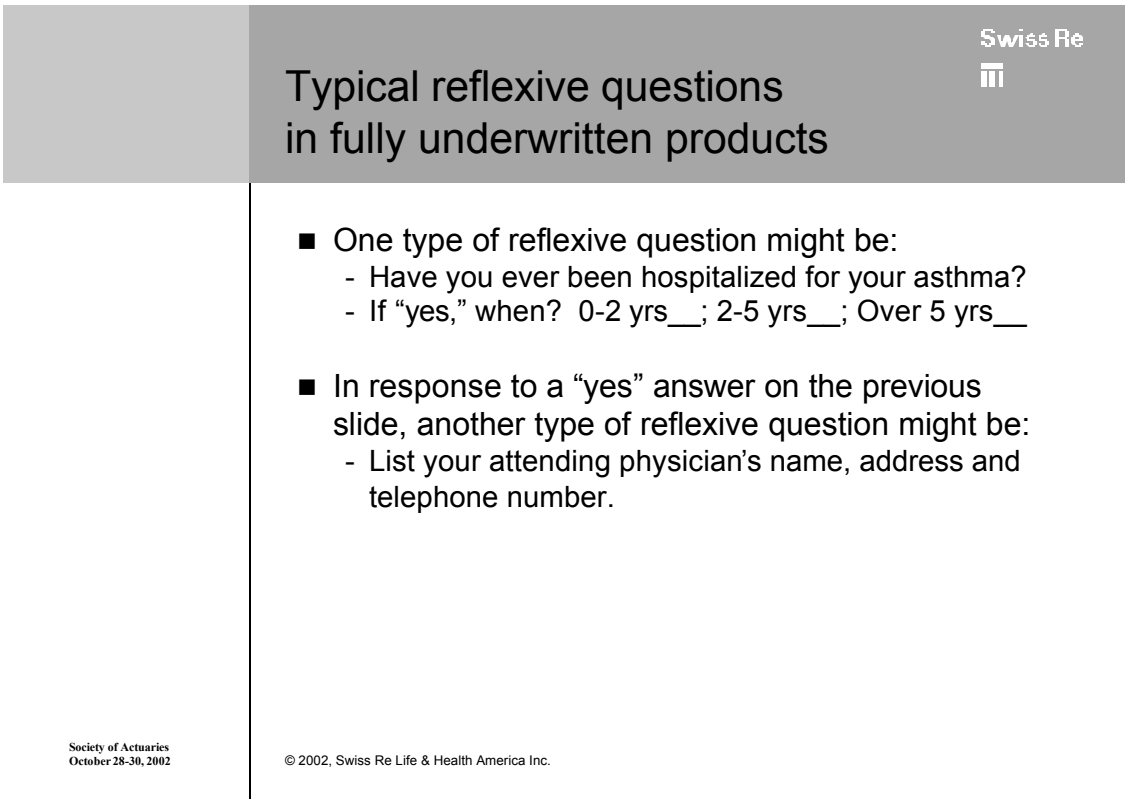


Figure 11



Reflexive questions are a little different, as you see on Figure 12. Using the asthma model, consider someone says "yes" to the question if he or she has ever been hospitalized for asthma. From a reflexive perspective, it takes more programming, greater intelligence and more technology to build this kind of system. Now you want to know when the hospitalization was. Maybe that's one of the questions that you reflex to. Maybe it says "0-2 yrs". If the person answers that "yes," you can develop some pathing or some decisioning that says you don't want to accept this risk because it's too soon. If, on the other hand, the person fits into the "2-5 yrs" category, maybe you want to ask another question. You want to know who the person's doctor is, who's treating the person for this condition. You will take and utilize that information and send it to an underwriter; the underwriter has the information needed to order a requirement. Was the person hospitalized for asthma over five years ago? That's trivial; move on.

Figure 12

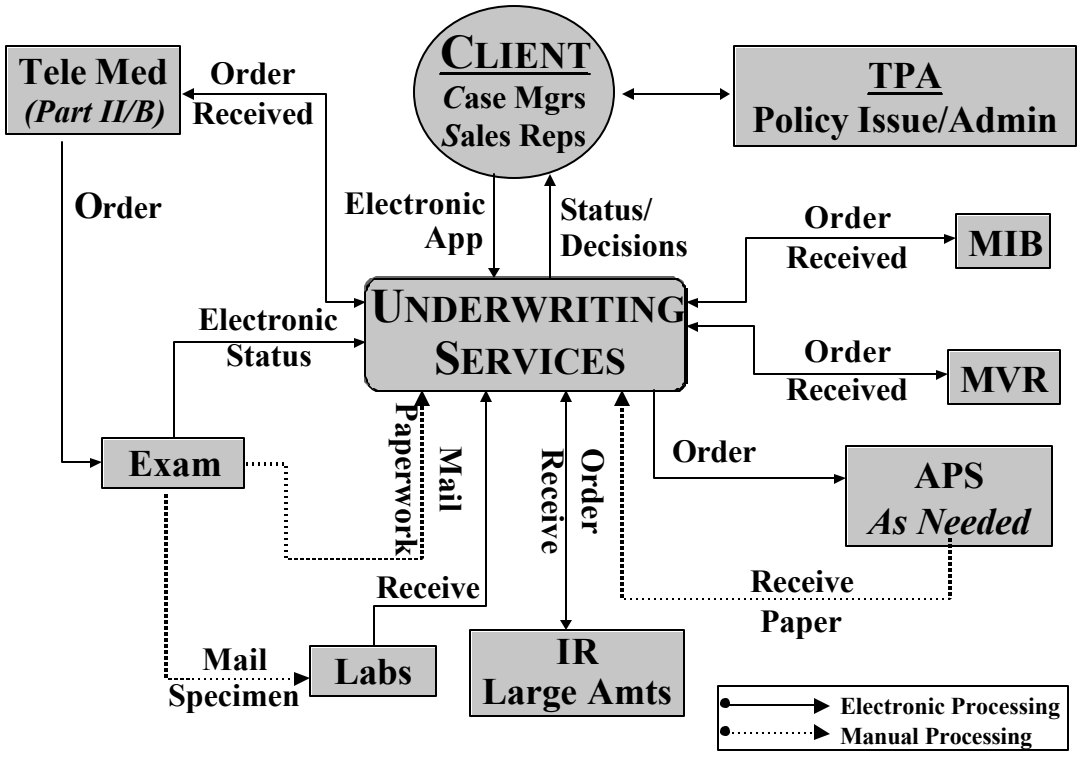


Those are examples of some drill-down questions. It's fun to build them, but it's also challenging because you have to match that technology.

In our fully underwritten model, shown on Figure 13, we use LUS and this is with a customer. Remember, we're sort of a back room underwriter here; we're not the carrier. When we develop things, we have to work within that process. There are a lot of discussions and decisions that are made jointly with the carrier as we build this model. As you see at the top, we've got the client. This is where applications are taken. They have case managers, who do the customer service and communication. They have their sales representatives there. They have an electronic application (app). The electronic app feeds into our underwriting system once it's complete. It's only Part One data at this point in time, meaning non-medical questions (driving, form of residence, those kinds of things) and no medical history questions. LUS has a process called "initial underwriting." Initial underwriting will take that, look at all the application data and make decisions about it. It's a process where you build the logic, the knowledge, into system administration tables and from there, things happen. It creates problems for the underwriter, if necessary. If there are no problems, it will start to order requirements. It will create them. It will order the MIB electronically? nobody has to touch it. It will do the same with the MVR, because we get that on every case. If an APS were needed, that would be ordered as well. We all use inspection reports

for very large amounts and you can order them electronically. We get a medical exam on every applicant as well. The average policy size is around a half million dollars.

Figure 13



We contracted with a vendor to collect this information. Now, the vendor has its own rules and tools to do a call center type of thing for medical history. We could order that electronically, then the call center goes ahead and orders this information. The call center calls up the proposed insured and goes through the medical history. It ultimately will print out on the customer's form. Once that medical history is collected, electronically it flows back into LUS. What happens? Initial underwriting runs again and tries to define what these problems are. Are there significant problems or aren't there? Initial underwriting also sets up the exam appointment for the proposed insured. Through this process, it prints out the answers to the medical history on the exam form. That is taken to the proposed insured at the time the paramed is doing that. The paramed collects that information and the paramed mails that paperwork back in. We get an electronic status from the paramed that the exam has been done and completed. The paramed also mails lab specimens out here, which includes some of the physical stats, like build, blood pressure and pulse.

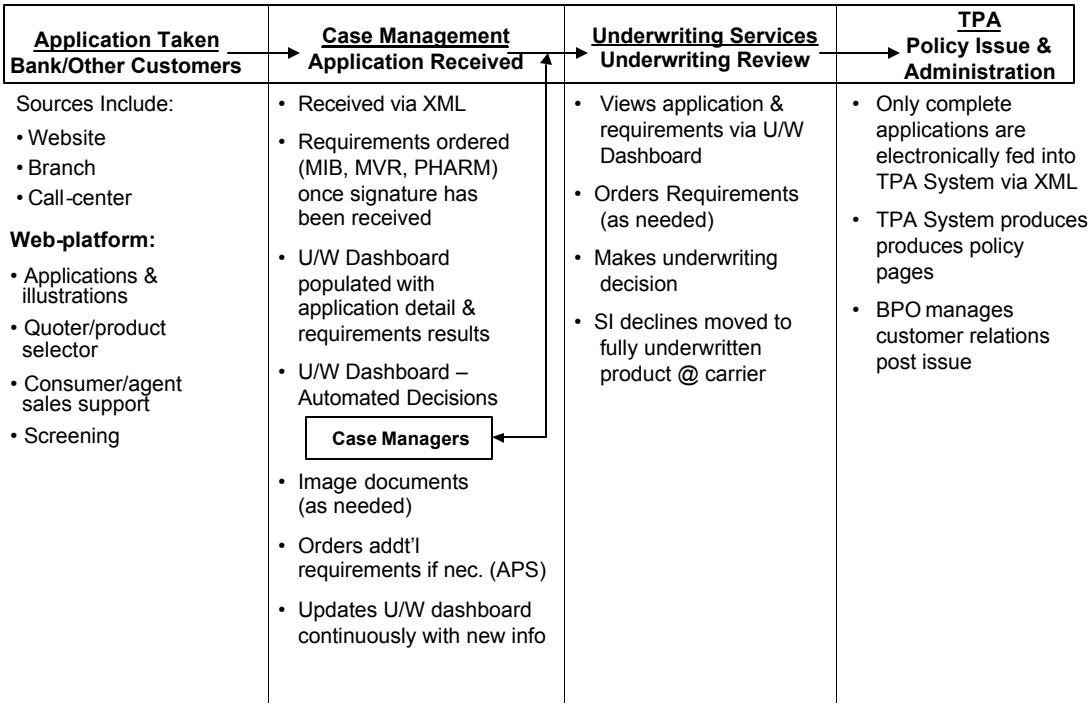
Labs record that information, process the data and send it in electronically. So we get almost all of our requirements in electronically. There are a couple of catches

here. Sometimes when people see their medical history printed in front of them, they say that the year wasn't "1995," it was "1998." They write on the application form and that causes you to do some manual work. That's part of that exception process. But in essence, as you can see, there's a lot of electronic flow here and it works pretty well. I would say it's not perfect, but it works pretty well.

Figure 14 shows a simplified issue. One of the things that happened when Swiss Re bought Lincoln was that we were bought into this. They're in the process of developing this electronic flow, primarily for the bank market, to start with.

Figure 14

Simplified Issue (SI) Processing Flow



It's a front-to-back system. It's really neat and we're in the process. One of the first things that we in underwriting services got to do was get ourselves immersed in this process. What's the knowledge that needs to be put into this? What kinds of things need to happen to make this flow very well?

It starts where the application is taken. It can be collected either via the Internet (it's Web-based), at a call center or at the bank site. It does all three. It has some enhancements there where you've got multiple-sales capabilities. If you're on the Internet, it does quotes and illustrations upfront and gives customer support. It sends it over to the fulfillment area. Once that information comes in, the fulfillment area will mail a package out to the proposed insured to collect the signature and the authorizations. We're working on electronic signature; we expect to have that soon. In any event, this is not necessarily true "simplified issue"; it's more what I

would call "non-medical underwriting." We're not going to get an exam on this business, but we do order MIB. We get the Insurance Activity Index (IAI), which is part of the MIB, to see if we've got someone buying a bunch of viatical policies or potentially doing that. We get motor vehicle information and we order pharmacy information. That's automatically ordered and sent out.

We have a process called the "dashboard." This is where the logic really resides. It's an application service provider (ASP) model, but that's really where the processing resides. That's like the underwriter's workstation. Details populate into that model. If everything comes through clear based upon the questions we had up front, it will make an automated decision to either accept or reject. It will go over to our TPA who is doing policy issue and administration, but bypasses the underwriting process. On the other hand, if there's something that's picked up, either from the pharmacy, the MVR or the MIB, that cannot be processed, then the underwriter gets involved. This is where underwriting services would take over. We're going to operate out of Ft. Wayne, Indiana, and our fulfillment center is in Columbus, Ohio. The underwriting is Web-based. We just get on the system and we can underwrite remotely. I like that.

If the underwriter needs to do anything, he or she can order an APS, maybe? we try to limit that? or a questionnaire. It's about as much as we do. The underwriter would then make an underwriting decision. Information would then, again, flow over to the policy issue and administration, the TPA that we've contracted with. It's a little bit of an expanded model. It's not exactly a simplified-issue process, but we have developed the technology to process all of this information electronically.

MR. SNELL: You make this sound like a turnkey operation. What are some of the challenges involved in a system like this?

MR. RIEHM: On the fully underwritten side, what challenges were we facing early on and what challenges do we continue to face in some instances? Remember, we're sort of this back-room underwriter working with another carrier or a couple of different carriers. In developing that work-flow process, the carriers themselves have issues and concerns and technology, so matching these things has been a challenge over time.

Collection of medical history from the data in that fully-underwritten model is a challenge. We're using a vendor to do the telemed. Some of the challenges that you have in working with vendors are that they've got their own systems, they often have their own technology to collect information and they also are sometimes unwilling to take risks. If someone says she had a birth of a baby boy named Charlie and that's how she answered the question, sometimes the person will key in "birth of a baby boy named Charlie." The system has to be able to identify those kinds of things to be able to process it. Now, we could build that statement into our system tables, but chances are we aren't going to see it again. So you run into some of those challenges.

One of the other things that we didn't expect along the way is that the vendors are developing a lot of information themselves. They want to earn your business as well, so they're developing electronic processes. When we were tying LUS into some of the information providers, they thought it was good to send us messages. "Hey, the applicant was on vacation, so we couldn't do the paramedical exam." That's nice information to know, but if they send us text, what happens? Somebody has to look at it. You need to work with the vendors in communicating how you get that information back if they want to send you status messages. Or you tell them that you don't want their status messages and that you'll pin them to get the information out and test where something is in the process. Those are some of the challenges there.

Amended exam forms are a challenge. They are not uncommon. This situation happens more than I would like. You can call it exception processing, but you end up in situations where people do amend things. They remember things differently once they see them in print. When they're about to sign that form, they'll make a change on it, and so you have to review that paper. You can use screeners to do it? it doesn't necessarily take an underwriter? but you have to account for that.

Automated approvals are a challenge. Our objective with our system is not necessarily to get to automatic approvals in the fully underwritten model. We're dealing with half-million-dollar cases. I'm not interested, necessarily, in letting those skate through without someone looking through, looking over how that information was collected, what it looks like and signing off, if you will. That hasn't necessarily been one of our focuses in our model, but it is certainly in other models. It becomes difficult to do sometimes, based upon some of the things that I just mentioned.

System modifications are a challenge. Mike Shoiber is responsible for LUS. When we need a modification, he's usually accommodating. But keep in mind that Mike manages a system that is used by many, many companies. When a significant change is needed to modify that, you may need to get the user community to agree to it. Otherwise you have to do your own modifications internally.

MR. HOBBS: There are some other challenges in addition to what Tom and Bill have already highlighted. You need to recognize that there are human beings who are going to be involved in this process of using automated tools. I've got two examples that might highlight this. I have changed the details, but the general ideas that I'm presenting here are actually live cases.

A typical question that you'll find in an application is, "In the last three years, have you been to the doctor?" The applicant looks at that question and says, "Yes, I've been to the doctor." The next question is, "Why have you been to the doctor?" Your automated tools lists hundreds of reasons why a person went to the doctor, whether it was chest pain, to have a blood test, an annual physical, or because of a broken foot and so on. Depending on what the applicant discloses, you know whether to go deeper or whether it's an inconsequential. This applicant says, "It's

not on that long list that you put together. I had something else. There's another reason I went to the doctor." You then ask the applicant to fill out a text box and tell you the reason that he or she went to the doctor. The applicant says, "Well, I was sick." Automated tools are not going to prevent you from dealing with real live human beings.

Here's a second example. An area that provides a real challenge is developing underwriting questions and decisions to handle foreign travel. It's a complicated process as you begin to think about all that's involved. You generally will identify safe countries to go to and you will identify safe reasons that those people went to the countries. If they don't go too terribly often, then those series of questions and answers will generally allow you to make an approval decision consistent with what a talented underwriter would have done. A tool can be designed to do that. You ask a question like, "In the past 30 months, have you left the United States?" The applicant says, "Yes, I have." You then say, "Where did you go?" The applicant says, "I went to Mexico."

The next question is, "How many times have you been to Mexico in the last 30 months?" You've built some trees according to specific guidelines so that if it's been a reasonable number, you're not going to worry about it. The applicant says, "I've been there 500 times in the last 30 months." You ask, "Why?" You type this answer in the text box so that Tom or one of his underwriters can look at it. You find out the person walks to work. The person lives in the United States and actually walks across the border every day to go to work. Again, automated tools will not prevent you from working with live human beings in live situations.

MR. SNELL: I know that both Tom and Alan have both simplified and fully underwritten systems. Can you tell me what the benefits are of your fully underwritten systems?

MR. RIEHM: Looking overall, the ability to order and process requirements electronically becomes a significant advantage. You segment these things. You look at various pieces of the process of underwriting new business that can help you gain advantages. Certainly that's one of the things that has happened.

We didn't start with a typical model where we had paper and then we moved into electronics. We started with electronics, so I can't give you exact numbers in terms of what our savings are in terms of human resources and those types of things. But in our particular model, there's no doubt in my mind that we have saved people, because we utilized people to underwrite other companies' business. There's no question that from ordering information electronically, not having to touch those systems, not having to file things or pick up paper and those kind of things, that we've saved people in both case management and in underwriting.

Obviously, there is a time savings. You get that done immediately. It's out there electronically and it comes back. Are we doing real time at this point? No. We haven't tried to do that, but we've certainly worked in some other deals where real

time is one of the objectives. We'll get there with some of the products.

Another advantage is the ability of the system to distinguish, utilizing tools such as what we talked about today, between "trivial" and "non-trivial" requirements.

I'd also say that we have reduced our error rate. Again, it's difficult to measure that exactly, but I know that we have better consistency. The problems are identified for the underwriter very clearly. Those that are trivial are marked "trivial" for the underwriter, so the underwriter knows immediately what he or she is supposed to focus on.

Workflow management delivers information to you in a nice, easy and consistent manner. Also, the electronic connectivity with the vendors has been good. They're very willing to work with you in that process.

But perhaps one of the most important things, particularly with my R&D background, is the data collection and the data that's available to you. If we wanted to, we could tell you what the average cholesterol is of a male in Boston at age 42. You can do that. That data is available for you to mine and utilize. In one situation, for this one customer on this system, we took that data, we collected it in our research and development area and worked with the customer on what the cutpoints might be for a new preferred product, because it worked that in conjunction with another tool that we use at Swiss Re. It was able to define very clearly where the customer needed to have its cutpoints and how many people it wanted to qualify at various levels of preferred. It was quite beneficial to do that data collection. We've done some remarkable things with that information.

MR. HOBBS: I'll talk about a couple of actuarial benefits. The two I want to talk about are managing policy costs and managing mortality. You've had a marketing person come and say, "I plan on selling lots of that new term product you just developed with those very competitive preferred rates." So you know that the assumptions that you would like to use in pricing are that it cost you about $50 to pay an underwriter for his or her time to actually underwrite the case and it cost you about $75 to pay for the lab tests involved to determine whether people qualify.

Here is the issue that you face as the pricing actuary. Are you going to spend $125 on every application that comes in the door, knowing that the way you cover your costs is not based on applications, but is actually based on paid policies? If it turns out that 100 percent of the people who apply for your coverage actually pay for the business, the pricing cost is actually $125. There's a direct match. However, if only one out of every three people who apply for the policy that you've spent $125 on actually pays for that business, your true pricing cost? the ability to collect it? actually translates into $375 per paid policy.

Automated underwriting tools allow you to more accurately determine which cases you want to go through the process of spending $125 on. You can immediately

begin to determine who are the people likely to get the preferred rates that they're expecting and who is worthwhile to proceed through the process with and actually spend the $125. Automated tools here may be critical to allow you to actually meet your pricing expense assumptions.

Let's talk about mortality costs. A new marketing person has come and said, "I have a new program. I want to sell simplified-issue life insurance to bank customers. I want to finish all the underwriting right then and there. I want decisions to be made immediately." You go through your actuarial assumptions and determine that the mortality charge that you have built in to your pricing assumes one death per thousand in the first year.

You assume you're going to issue 1,000 paid for policies and the average face amount is $75,000. Here's the issue that you face as the pricing actuary. If you go through the arithmetic, you will determine that you have collected $75,000 to pay for all of your claims in the first year. If even one person selects against the company and dies within the first twelve months, you could have twice as many claims in the first year as you've actually built in the pricing. Automated tools help you identify some of those individuals that are selecting against you. Again, automated tools may be critical to you to actually achieving the mortality margins that you built into your pricing.

MR. SNELL: How about simplified issue? What are some of the benefits and challenges there?

MR. RIEHM: I would say one of the challenges for this simplified tool? we got into it a little late as it was being developed? is that it's developed from scratch. That's been a bit of a challenge because we have a lot of different partners involved. The communicating back and forth? do we take trips there, do they come to our office? has been one of the challenges.

Developing the ability to process pharmacy data is another challenge. Pharmacy data is a new tool and there are challenges with that new tool. Not all of the information that comes in through the pharmacy benefit managers is on your applicant, even though they put the person on your card. To be able to screen those people out becomes a bit of a challenge. We've seen in some of the tests that our research and development area has done that you see males on Prempro estrogen hormone replacement therapy and things of that nature. It's a challenge to be able to do that, but our R&D, medical staff and underwriting folks got together and actually created a process and a system and a tool that fits right into that. That should work pretty well.

There are some limitations in the system thus far, not uncommon, but we'll work on getting those corrected. That exception processing and the amended applications are challenges as well.

From a benefit standpoint, from our perspective, it certainly allows us to get into a

new market. We can get into some of the bank markets and things of that nature that we would not have been able to. This is an expanded model. Other carriers can use this; it does not have to be used by one, a single carrier. You want to go to automatic approvals and declinations, particularly with simplified issue kinds of business. It's reusable and it's expandable. Again, it's a tool that can collect application information from multiple sources. Those are some of the primary benefits.

MR. SNELL: It's clear that you three have experiences, that you've actually walked the talk. Now we come to the big question. Automated underwriting? panacea or Pandora's box?

MR. WELLNITZ: In the work that I've done with our customers, I'd have to say that it could be either. Pick it. There are some real keys to success. Think through your business model. This doesn't have to do just with the automated underwriting part of it. You have to think about each and every step along the way? the markets, the distribution, the whole customer acquisition aspect? but you have to place the risk-selection vehicle within the context of your overall business model. That alignment of the risk selection is what's going to enable you to achieve the benefits. Frankly, it's going to give you the backbone to put the effort into making the whole thing work. But don't go further than you need to in order to support your business model. There will be a lot of "gee whiz" sort of things. "Gee, if we can do this, we can do that." "If we can go this far, we can go one step further." You've got to put the brakes on. You've got to keep the thing focused on what you're really trying to accomplish. Keep the program limited to what it takes to achieve your business objectives.

Then, as Tom mentioned, the data that should come to you through this vehicle is golden. You have got to be prepared to use that data every day to learn what's happening in your business and to modify your system, not just the underwriting system, but your whole business system around this particular market, so that you can make the adjustments necessary to improve the success of your business. If you can do all these things, then I think you'll find that automated underwriting in the context of your business can actually be a panacea.

MS. AMY POWERS: In a traditional underwriting method, you have the applicant's signature that allows authorization to get medical records. It also gives the insurer the right to go back and check for misrepresentation for recision. With a call center or Internet type of interaction, how do you deal with getting that applicant's signature?

MR. RIEHM: In the models that we have, we're getting a Web signature. For example, in the fully underwritten model, the proposed insured submits a preliminary application with that authorization signed. That comes in as part of that initial application. When you get into Internet situations, you have to collect the information, allow the proposed insured to print it off and send it in, with a Web signature. Or can you deal with an electronic signature? We think we can do the

electronic signature, particularly on the Internet types of business that we have, so that will suffice.

MS. POWERS: It's kind of risky, right?

MR. RIEHM: It is risky, without a doubt.

MS. POWERS: The second question I have is with regard to the reflexive questions. You typically need to have the application on file with the insurance departments. With these reflexive questions, have you found that you can just file the normal, standard-type traditional application, or do you have to file all the logic behind it?

MR. RIEHM: I would just say that different carriers who are implementing this have different risk tolerances. Some would say that they don't have to necessarily file all the drill-down questions or reflexive questions and that they can go with their standard application form. Others, on the other hand, have taken a different approach. They would say that if they're going to do this, they want to make sure that the states are giving their stamps of approval. They would file all of those questions and have them on file.

MR. HOBBS: Tom is right. It does depend on the carrier's interpretation, as well as the state's. In defending the first approach of saying you don't need to file them all, the logic is that you don't file every single question that an underwriter might ask. A state doesn't have interest in looking at all of that, so why would it have interest in looking at what simply is a translation of questions that are in Tom's brain to a sheet of paper or into a piece of technology? Again, you need to talk to the carrier and, as you would expect, different states will approach it differently.

MR. STEVE KOSSMAN: We have found that it would depend upon the state. We have found that most states don't require drill-down all the way. There are a couple of states that wanted screen prints of each page.

I have a question on the simplified underwriting where you are willing to go with 175 percent mortality. You have a particular question that, depending upon "yes" or "no" would make the case a Table 1 or normal, and you are satisfied knowing it's Table 1 or normal. There's another question that again might be Table 1 or normal. But if a person answers "yes" to both questions, that might become Table 3 or Table 4. It seems when you're talking about combinations, you can't let anything go because you don't know how you can get these combinations together.

MR. RIEHM: You need to think through how those questions are laid out. If I get a single "yes" answer? the way that I would lay those out? I would not accept that person, because I've defined the questions in such a way that either one of them is significant enough.

MR. SNELL: I was the systems architect in the AURA system when we developed

that. We took the adventure-game approach. In an adventure game, if you walk into the room with the dragon, you'd better be carrying the singing sword or your charisma points take a big hit. What we did was basically take that approach. If you walk into the diabetes room and you're carrying hypertension with you, your insurability takes a big hit, too. You can build in ways to get the synergies.

MR. KOSSMAN: Let's say you ask "in the last five years" and the answer is "no." You don't know if "no" meant "six years ago" or if "no" meant "never." Six years is fine because that's only 25 percent. You ask another question, it was "no" also and you're saying that's okay. I understand how you proceed when you get a "yes" answer. My question is, when you're getting all "no," "none" and "never" answers because you've made the range of questions such that "no" could mean "normal" or "no" could mean up to Table 3, how do you have the information then to combine together that says these two "no" answers together? one of which was okay? might be a problem?

MR. RIEHM: You have no guarantees. That's why it takes a lot of care in designing some of those questions. Maybe make it ten years instead of six years and then you'll say you really don't care because ten years ago was clearly standard. How you define them is important.

MR. WELLNITZ: This sort of thing was brought up by a couple of people that I talked with as reasons why they moved away from trying to develop a system or help support a system that was intended to make highly differentiated underwriting decisions, and moved toward a system that was intended to "green light" things that were clearly mainstream and then present to the underwriter all of the information, clearly packaged, so the underwriter could quickly focus in on the questionable aspects of that risk and do the balancing. The efficiency, the effectiveness here, was not having the underwriter look at anything he or she didn't have to, and secondly, presenting cases that were ready and clearly, normally packaged for the underwriter to quickly focus on the issues, so he or she can move that through rapidly. There are also some benefits in terms of being able to present to the appropriate underwriter the appropriate cases, whether it had to do with size or with the nature of the risk question. The struggle that they had was that trying to come up with all of the "what ifs" and combinations got to be so immense that the complexity was just not worth it to try to get to the market they needed to get to.

MR. RIEHM: In one system that we worked on, we defined even trivial illnesses. We assigned them not debits, but we assigned them some points. So if you add them up, you had ten trivial illnesses, like flu, poison ivy, cold, a little weight loss, and so forth. They add up. They total a certain score. If you get to that score, you could take it to an underwriter. There are various ways of thinking through how you might want to process that.

MS. KATIE TEAGUE: In one example you had two drill-down questions; in another example you had six or eight. Do you always ask all of them, or do you

prioritize them until you get a "yes" or does it depend?

MR. RIEHM: It depends. Where does your logic reside? If you have to wait on the back end to really solve for these considerations, then you have no choice but to go through all of the reflexive types of questions. But if you can do some things up front where you have some logic built in that initial application process, then you could stop at a particular point in time. If the applicant answers this one "yes," you don't want to ask them any more questions. We've done that in some situations. All of a sudden the applicant says he or she had cancer last week. There's no sense going through the entire application, so you save yourself and the customer some time.