

**RECORD OF SOCIETY OF ACTUARIES  
1995 VOL. 21 NO. 1**

**SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT**

Moderator: GREGORY M. MATEJA  
Panelists: ALAN CUTLER  
              JOHN D. DUGAN\*  
Recorder: GREGORY M. MATEJA

*Why do systems projects seem to take so much longer than originally thought? If we spend the extra time, do we really get a better system in the end? Why does testing take more and more time and seem to be less and less effective? We have all these project management tools, but why do we still have problems managing these projects? Systems development is a technical discipline different from actuarial work in both methodology and expectation. As actuaries become more and more involved in systems activities, they must better understand these differences.*

MR. GREGORY M. MATEJA: Our goal is to help you to understand a few key lessons that can be implemented at your companies to manage software development projects.

Our two panelists are both experts in their field. Alan Cutler is an actuary at USAA Life Insurance Company. USAA is a technologically advanced company with a great systems infrastructure. As a result, it has a very low cost, which is also aided by the fact that it has very few direct agents. For the past several years it has been developing a new health, annuity and life insurance administrative system. Alan's role there is to help specify the actuarial portion of the system's development and to assist in testing the actuarial portions of the system.

John Dugan is a senior manager with Andersen Consulting in Boston. Andersen is one of the leading firms involved in systems design and analysis related to business integration and development. John is currently the onsite project manager at The Hartford Life, where he is overseeing the development of an administrative front-end system. USAA is concentrating on the development of the core system. This brings out one of the lessons that we're going to talk about in the presentation; namely, that there is no one right answer. Each company has its own set of cultures, strategic business alliances, and strategic business objectives. At The Hartford, we think that our greatest need is to develop a new front-end product. USAA thinks that it needs the core administration system first. Eventually, both companies need both pieces. The structure and management and style of the two projects are very different. Both involve more than 100 people.

The presentation will focus on the lessons that our panelists have learned in their software development experience.

MR. ALAN CUTLER: I'd like to give you some background on the development of the health, annuities, and life (HAL) system. I joined USAA about two years ago. I am told that in the mid-1980s the company had many different administrative systems: some for

---

\*Mr. Dugan, not a member of the sponsoring organizations, is a Senior Manager at Andersen Consulting in Boston, MA.

## RECORD, VOLUME 21

health insurance, some for annuities, some for life insurance. USAA is a very service-oriented company that prides itself on the service it provides to policyholders. It was having significant difficulties with the different systems, some of which didn't support product features. As a result, the decision was made to build or buy a new system. The commercial systems available in the mid-1980s did not have what it was looking for, namely, product independence that would allow equivalent support of the major product categories.

After looking at all the available systems, the decision was made to build a new system in-house. Andersen Consulting was called in to help out with both the design and the implementation of the system. The first step was a cost benefit analysis. The cost of developing a system from scratch was determined to be significant but the benefits would be twofold. First, employees could be trained on one system rather than five systems, and second, new products could be implemented within four to six weeks.

The decision to undertake the project was made in 1987. It was decided to begin with an upfront design. Specifically, all data elements were determined, the basic architecture was specified, and support requirements were listed. Data elements are all of the policy information to be retained on the system. Architecture refers to the processing approach within the system, and the company decided to use a function-based system, which I'll talk about a little later. Examples of support requirements include items such as periodic dividend statements for traditional products. The result was a several-hundred-page document listing the system requirements. Once this was approved, the project was started.

The project was divided into phases. The first phase was a billing and collection system that would interface with existing systems. This was necessary to centralize all the billing and collections. It replaced the billing and collection portions of four existing systems (a health system, an annuity system, and two life systems). Also included in the first phase was core administration of the nonparticipating term products, which accounted for a large proportion of business.

To some experts, USAA is more of a mutual company than a stock company. Most of the whole-life products and a great deal of the older term products are participating. USAA also has large blocks of universal life and annuity products. The project began with nonparticipating term. It would be the simplest to develop because there are no cash values or dividends. This first phase was completed and in production by the end of 1992. This was a big accomplishment, and I joined USAA shortly thereafter.

The company needed full-time actuarial support and it had this on the first phase. On the second phase it needed a full-time actuary to work with the compliance calculations, universal life, annuity account values, and related issues. This is my job.

The second and third phases are being worked on together. These are to support all the other life insurance products—participating products, universal life, and fixed annuities. Initially, the company wanted to do the whole life as phase two and the flexible products as phase three. Ultimately these were combined, and we are scheduled to go into production approximately one year from now. We're just about to start our first system tests.

## SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT

Before we go into production, we need to convert all our whole life, annuity products, and universal life from our old systems onto HAL. This is an enormous project, but we have it under control. In fact, we have already started the conversion. All of the nonparticipating term products have already been converted, and it went smoothly. I've worked with conversions at other companies, and this was the smoothest conversion I've ever seen. Everything came across with absolutely no problems. Of course, these were the simplest products. We have already developed the strategy for conversion of our other products, and we are optimistic that their conversion will be as smooth.

The basic features of the system are those we dream of for every system. Every system should have each of these features but a great many systems do not. Currently, policy issue and in-force administration are done by separate systems, which means duplicate data. That's gone with HAL. The policy issue function is integrated directly with the rest of the system.

We're also developing our own policy exhibit that will integrate with the rest of the system to produce valuation extracts. We just changed from a mainframe-based valuation system to a personal-computer-based valuation system.

I'll review the unique features of the system. Recall that this project was developed in the mid-1980s, so the technology at that point was mainframe based, and client-server systems were still in their infancy. While the decision might be different, USAA didn't want to risk its entire in-force block of business on a client-server system. It chose a mainframe DB2 system with IBM terminal screens. In the back of the company's mind was the idea that this could be converted to a client-server system relatively easily. We will probably convert the interface to a client-server system but leave the database that is on the mainframe.

The database is relational. I had never seen anything like it before, but it's very good. It is a rules-based system, meaning that products are completely independent. About 85 rules control the features of the products.

One traditional administrative feature that is missing is plan codes. This eliminates the duplication that many systems have. An example will help you understand. Let's say that the product is a waiver of premium expiring at age 55. You just define a coverage called *waiver of premium expiring at 55*, point it to a set of rates, and then you are done. You could have other products, each pointing to a different set of premium rates. It's a good system, and it's going to save a great deal of time and space.

The system will administer all our lines of business (health, annuity, and life) according to consistent rules. For example, we will easily be able to ensure that annuity tax reporting and life tax reporting are the same. We don't have to make changes, we just update the rules to keep making fixes and changes in the programs. Frequently, companies buy a system and change the system's code to support their specific products. We won't need to do that. We'll just update some rules. The entry of the rules will be done with a client-server system. Users will have OS/2 screens on which to enter the properties of each product or coverage.

## RECORD, VOLUME 21

The system will have flexible tax reporting. In other words, we are going to track bases and gains for all policies. We will track all tax considerations through what we call *tax error funds*. This will allow us to give reports or perform studies at a detail level.

The rate file structure will not have any duplication in rates. If waiver rates are \$0.05 through age 50, that \$0.05 isn't going to appear 51 times, similar to how it is done in many systems. We will have a neat method for inputting rates. We can use a spreadsheet, print rates to a text file, and import that into the system. That's a very quick way to enter rates, so that the product development area only needs to provide us with a simple file when the pricing and testing is completed. Those rates will go right into the system, and it can be done in one day if necessary.

Our system will be a function-based system. Every transaction that's applied will call a function. For example, accepting a cash payment will be a function. That function will be tracked down the line. There will be histories of that function. If any reversals must occur, we can just go back and undo and redo. Most of this can be accomplished on-line by the user.

Our illustration system will be integrated so that we'll be able to do an in-force illustration very easily. A user may pull up a policy and select from a menu of in-force illustration options. There will be flexibility with respect to interest rates. The illustration will be done on-line rather than via batch processing. A great many of the functions will be performed on-line. For example, decreases in coverage and increases in coverage (providing they have the underwriting data) will be able to be done on-line by the user and processed immediately. The evening cycle will update all the contract data and send out the necessary correspondence.

Now John will talk a little bit about development theory.

MR. JOHN D. DUGAN: Before we go on and talk about theory, I think I will just back up and pick up on a couple of Greg's initial points. For the most part, you are going to be involved as users or project directors in your day-to-day jobs. Alan just took you through an important issue facing the industry right now—aging administration systems. No matter where you go or where you work, you'll be coming in contact with these issues. Dealing with systems development and changing technology in any business is difficult these days. It's hard for many people to understand the process and get involved. Our presentation will give you some ideas of areas where you might be able to help your project managers and provide leadership from a business perspective. You are the people on the front lines in terms of developing products and relating to the market. The major issues are how to manage the products and how to manage the systems. Alan has walked you through the USAA approach to these issues, and I will describe a different approach to a similar project and show you how the basic steps and project management are similar.

Most of you are aware that The Hartford has had tremendous success in the individual annuity area. It is investing to maintain and grow that business. It has elected a different strategy, one that is more in line with the issues it deals with on a day-to-day basis relative to its distribution channels and the leverage that it thinks it can provide. It has tried to find a way to bring value to the marketplace first. That's the overriding theme: how do we get to the marketplace and have the marketplace think an impact from the investment

## SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT

is being made? In addition, it wants a phased development of the system to minimize risk.

An aggressive schedule is part of the use of technology as a competitive weapon. This system also must serve as a foundation for the architecture of the future. It has decided on a client-server environment with Hewlett Packard servers, Intel-based front-end workstations, and an Oracle database. There is an interface to a service bureau core administration system.

Additionally, it is implementing work management to improve the process and measure the work more effectively. Enhanced management reporting capabilities will allow people such as Greg to get a clearer picture of exactly what the business is doing.

The strategy is to examine the core administration system and to break out the pieces that can be moved into the front end on a client-server basis. After the front end is built, the primary functionality left in the core would be what is related to fund processing.

To give you a sense of the project magnitude, we expect to use about 20,000 man days. The team is currently in technical design.

Let's now examine some of the common questions that senior management asks about projects. Very often it doesn't get clear responses. What is it that those questions elicit with respect to the development of systems? To answer this question, we will focus on things that can change current perceptions.

When thinking about systems development, we need to first define what "successfully managing systems development" means. There is an old developer adage that says you can have any two of the following three items: rapid development, high quality, or low price. A basic framework of success is to pick the two of these that are most important. If you try to get all three together, you can run into conflicts.

The next thing that is important to understand is that there are many development methodologies, but all do the same things. It's in the execution where you differentiate yourselves from your peers. The planning phase develops the conceptual plan for the system. That's where it's very important that you be involved to define objectives. Next, you move into the design phase. In the design phase two things happen: user design and technical design. The specific requirements are determined in the user design phase. It would also be important for you, as actuaries, to be involved in this as well. For technical design, there's a transition to get more technical people involved. They take over through the build process and through a significant part of the test process. At that point, there would be a transition back to a functional context, and it will be very important for you to come back and check quality. The roll-out phase is key, and future evolution is based on where the business is going.

There are four areas that are good checkpoints: commitment, justification, direction, and change. On the commitment side, we always start with "we're going to do it!" What does this mean? There's a lot of excitement. Everyone's involved in the project. At this point, it's very important to make sure that you hold senior management responsible for taking the time to understand what it is that senior management is saying.

## RECORD, VOLUME 21

There are specific justifications for undertaking technology-driven projects. Do we want productivity? What does productivity mean? Does it mean that we're willing to change head count? Does that mean that we're going to make efficiencies available to improve service? Is there a competitive advantage to be gained? Is the technology that will be put in place going to be used as a weapon, and, if it is, let's make sure we understand what that weapon is and how it will be used.

We are all going to deal with change because the financial services industry is experiencing regulatory change and a real blending among banks, insurance firms, investment management firms, and the securities industry. Each change opens up new doors that need to respond with product offering. We're going to make sure the technology is there to support this evolution. This will ensure our competitiveness and the ability to take advantage of those regulatory changes.

There could be a desire for business change. Probably everyone has seen the move from principally paper-based environments to the use of image technologies. Right now, we're all thinking, "What is the Internet going to mean to us?"

MR. CUTLER: We basically followed each of the principles that John just reviewed in developing our system. Our goal was to increase productivity in our service areas to produce cost gains. USAA takes pride in its service, and maintaining a high level of service was very important. We were having difficulty with different systems supporting different products, especially when a client had both an annuity and a whole-life policy. The employee assisting that policyholder couldn't get all the information on policies without having to sign off one system and onto another. The new system will have automated support for all contracts. We want to be able to implement new products quickly and, again, by using some of the things John just mentioned, we were able to include this objective in the design. We have flexibility to design and support virtually any product because it is a rule-based system.

MR. DUGAN: The next point relative to business lessons is that from a justification perspective, we needed to be realistic. A realistic cost and a realistic definition of the value for the new tools will allow those responsible for the system to be accountable. At the end of the process, they can compare actual results to those originally projected. In looking at that cost-benefit model, try to make sure that it's real; try to make sure that the quantitative benefits that are written down are ones that can be measured and reviewed at the end of the process. If you can't see the benefits clearly, there's probably a reason. One of the best ways to resolve some of the issues and questions of senior management is to increase the level of accountability.

The next lesson would be in the area of the direction. As Greg stated and Alan supported, systems development these days generally requires aggressive schedules, which means that you're going to need bigger teams. To ensure that the bigger team is efficient, direction will have to be clear. If everyone is pointing in the same direction, it will be much easier to get to the end goal.

The next point is business integration. This is the trend. It's no longer the older approach of putting the new system out there, training employees, and saying that you are done. It's now reengineering: have we looked at the process and what does it mean to the organization? This is followed by procedures and training. The message is that there is a

## SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT

structured way to do this. Take the time upfront to think through the structure and how it will change when you eliminate tasks with new tools and new processes. What will it mean to your organization? With this clear vision, everyone in the business group can see clearly where he or she is going and what it means. It reduces the anxiety level right from the start and it allows individuals to quickly see the benefits.

MR. CUTLER: Again, we followed this approach at USAA. The last four steps were done inside what we call a model company, which is just a duplicate of our policies run in parallel with the existing system. I wasn't with USAA at this point in the first phase, but we're going to have another one for the next phase of our project. The idea was that users of the model company were watched as they used the system. We can hear them cursing if they have a problem (I'm told that happened in the first phase). After the system has been thoroughly tested but before it goes into production, we'll run about two months as a model company in which the users will be performing their normal tasks. The idea is that the model company is a laboratory.

MR. DUGAN: I think that Alan's points are very good. At The Hartford, we found that this is something that the business community needs to consider. We can lay out the structure. We can facilitate discussions, but they need to get involved. They need to decide what kind of an organizational structure they want and then they can move on and do that work alone.

MR. MATEJA: I'd just like to say that at The Hartford, the change management piece is very important. I can't emphasize enough how important it is in a big project. We have an administrative area with more than 500 people. All that these people know initially is that we are reengineering. Many people think of reengineering as a euphemism for job cuts. Managing change and getting across to people that we don't want to cut jobs, that we want to manage the process and help them to be more efficient is vital to project success. We have experienced growth, and we intend to continue to grow. To deal with this aspect we have regular bulletins on change. There is a group of people whose job is to answer questions, support people, and help them through the change. If you undertake a massive project such as this without considering change management, you'll be doomed to failure even if you develop the best system imaginable.

MR. DUGAN: Greg's right, and the difference there can be whether or not the user community pulls the system into production. They're going to either embrace the new system or decide that they're not happy with it or the whole approach and decide not help the process. I can tell you that there is no better feeling than to see people pulling the system along.

Given change management, the next step is to get involved in helping to manage the project and to move it forward. The key is to understand the plan, follow it, and understand the people. This is a continual challenge because technology is becoming more sophisticated. Our goal is to bring discipline to the process and to help manage quality. Upfront we've done conceptual work in terms of figuring out from a business perspective what we want to do. But it's also important to sit down with the development group and talk about exactly what's going on. They need to understand the business processes and purpose in addition to their development skills. We are back to fundamental communication, but that is very important. Make sure that you're not saying one thing

and that the developer sitting across the table is saying something else. Be sure you're both thinking that you're getting what you want out of the discussion.

The next point is that a plan will be put in place, and it will be driven by the estimated effort needed to complete the project. It will then be staffed and scheduled. An organization chart will be developed. Understand the milestones within the schedule. A good tip is to watch your project's organizational chart. If it starts to bounce around and change, that's an early indication that there are problems underneath that you should start to look into. See if you can help in terms of how to correct them or how to recover.

We talked about a process that we go through in reengineering and setting project direction. It's important to understand the building blocks to obtain the upfront commitment and agreement on when everyone's going to sit back down and review progress to make sure that project milestones are achieved as appropriate. Avoid the situation where the developers go into a vacuum and don't come back. Pick out points along the way to sit down with them and talk about what's going on. The process of system design is a building block approach. If you need to remove any of the blocks after they are assembled, it can be difficult, painful, and costly.

We see a lot of customer focus in our business these days. We all have customers whom we need to service. This often amounts to providing them information about what's going on. It's very important in the process of managing the project that you figure out who your customers are. You maintain the focus on them. You help them understand things such as scope definition. You may need to give them more information than they want in an effort to bring them into the process. Help them understand what *scope creep* is. What does that mean? What happens when items come up that were not in the plan? How do you get them back into the plan?

MR. MATEJA: Could you define *scope* and *scope creep*?

MR. DUGAN: Sure. *Scope* would be the overall definition of the functionality that would be delivered to the business community. It would be the tools that you are going to deliver for the business community. *Scope creep* refers to the tendency to add requirements late in the process.

Alan identified new business and all the other components of a core administration system. In the case of what The Hartford is currently doing with the front-end project, it is working on the new business, the producer support, and the in-force pieces.

In our case, as The Hartford wants to support new products, we have to go back and determine what we are going to do so that new products are supported when we deliver the system. So I think it is important to understand that concept. I don't know if you would add to that.

MR. MATEJA: I'm one of the people responsible for scope creep. I'll go to John and I'll ask for support of a new product or feature. John sometimes says that we can't do that. It's out of scope and, from his perspective, that's correct. I've ultimately agreed with every decision. There have been a few times when items have been added to the project, but generally we've focused on the scheduled deliverables. Basically, that allows



## SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT

the developers to focus on what it is that needs to get done and not on undoing work that's been completed. It also helps to ensure timely completion of the project.

MR. DUGAN: That's right.

MR. MATEJA: The focus on scope extends to senior management. If I go to others, they listen to both sides. If the decision is to expand the scope, then it's going to cost more money, take longer, or something else will need to be left out.

MR. CUTLER: We have had significant voluntary increases in scope, which we'll talk about in a little while, but it's very easy in these systems to do that.

MR. DUGAN: Those are good points. All projects deal with them and we try very hard to not say no, but to remind people that the options, when something such as that comes up, are exactly as Greg said: more time, more money, take something else out that isn't as highly valued. But, once again, if you've agreed on those up-front check points, you're going to be able to come back and review your progress.

MR. CUTLER: I have some brief overviews of how we've managed HAL. We have approximately 200 people involved. That includes permanent USAA employees and Andersen Consulting doing both programming and analysis for us. There are full-time users involved in the design processes and they are permanent in the systems area right now. The users basically design the system. We have me and another full-time actuary. The other actuary is more of a valuation-policy-exhibit person. I am more of a product person. Some annuity people have also worked with us. So we have every aspect covered from an actuarial standpoint.

We have weekly meetings where we raise issues. Each issue could be something as minor as changing the description of a data element or as complex as adding a new process that would increase the scope of the system. These are thoroughly discussed and sometimes fought over by many people. We have gone to senior management of the life company to resolve some issues, especially the expensive ones. If we want to add a new feature, it is a business decision.

Since the beginning of the project we've raised almost 1,000 issues, and most were resolved at the analyst level. Of course, there always has to be approval at the management level for any cost increase. Many times the issues can be resolved within the current system design. We always make sure that all our teams are aware of any changes. If you make a change to one process that affects other processes, everybody has to know about the change, and we make sure that that's always done.

We've always tried to justify our cost increases by comparing the additional benefits with the additional costs. This approach has been fairly successful. Of course, our costs have increased, but I think we're going to get the payback for the extra investment.

MR. DUGAN: The next point from a project management perspective is people management. The client-server environment is more complex than the traditional mainframe environment. There are more pieces in the puzzle. As a result, you need to bring together many kinds of experts to be successful with the project. Technical skills are going to be key. Help your project manager think about forecasting and training. Are the

RECORD, VOLUME 21

people going to be available in the schedule when they're going to be needed? That needs to be sequenced and costed. The people are the real development engine. These projects typically have a very aggressive schedule and require a lot of hard work. It's very important to watch the team's morale, and that's something everyone can assist with. Are the communications clear? Are things being done appropriately with the staff to keep them involved and happy? And socially, is the team climate affected? Once you put people into the process, you want to keep them involved and keep them to the end.

There's a discipline to project management that we need to maintain. We estimate the work, we put the budgets in place, and we execute. It's important to check back. We don't want to do all that work and then not use it. There are many software packages available to assist in project management. Even so, the management process is difficult. This is an area where actuaries can help out. You have the skills to look over numbers, see trends, and identify issues within the information that maybe everybody else doesn't see. If you get involved in the planning process and understand it, you can then start to help interpret what's going on and that would be value added.

In the end, success depends on accountability. Do people feel ownership for the project? If they feel ownership, they're going to bring their best to the process. Are the deliverables appropriate? Spend some time with the deliverables that come out of the project and look them over thoroughly. You probably may not have time to review all of them, so pick a few out and go through them. Examine the quality. Be involved in the measurement process. As I said, you add those skills and then leadership makes the difference. If you're thinking ahead and you have a good understanding of the business needs, then you can provide leadership to the project and that will make a difference in a project's success.

These projects are big, but they're not easy. Take the opportunity to learn from where others have been. Most of this has been done before; leverage that. If you go beyond the four walls of your enterprise, you should start with a good foundation.

MR. JUSTIN N. HORNBERG: With respect to the system you're building at USAA, you talked about a customer having both an annuity and a whole-life policy and the analyst having to log off of one system and log onto another. Have you given any thought in either system to having on-line access for policyholders? Agents could get an updated in-force illustration right on-line, maybe even requiring on-line illustrations for new business to track closing ratios and things of that nature.

MR. CUTLER: Definitely. We're in the process of doing a voice-response system now where a customer can call in directly. This will allow access to any system we have. It will access the database and it will quote the customer's cash value. In the future, an in-force illustration can be done instantly and either be faxed or be sent via a modem.

MR. DUGAN: In The Hartford's case, the system case will be available to the distributor channel. A voice recognition unit (VRU) is in place. Providing dial-in capability over the Internet or directly raises many security issues.

MR. MATEJA: Even providing producer data causes many security issues. There are different types of security issues in the sense that we deal with many distributors and we don't want any of those channels to get information about the other channels.

## SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT

MR. HOWARD W. HEIDORN, JR.: What language is the number-crunching written in? Is it COBOL, Assembler, or something else?

MR. CUTLER: Remember that our system was developed in the mid-1980s, so at the time they were using COBOL on the mainframe. I was surprised by the new compiler for COBOL. The new COBOL is object oriented, and it addresses memory. I was in favor of using Assembler language for the calculations, especially the iterative number-crunching. The problem with Assembler languages is that there isn't a lot of support. There is a shortage of good Assembler programmers. Of course, COBOL has a real problem with rounding. But I've worked with our programmers on it, and we have everything carried to large numbers of decimal places. From what I've seen, it's relatively fast.

MR. DUGAN: That's not a major issue in The Hartford's case. Major number-crunching would be done in a subsequent project, but the current project is written in C and SQL.

MR. GARY J. STRUNK: If you had to do this all over again, based on the systems available today, would you still use an in-house approach?

MR. CUTLER: I suppose we would. I don't think any administrative system has what we are going to have in HAL.

MR. DUGAN: You asked a very interesting question because the nature of it suggests that there are some alternatives. I think Alan's comment is right on. When we started the project with The Hartford, we reviewed packaged software products in the marketplace against the business requirements. We even took it a step further and looked at other industries that do similar things to see if there was something we could customize.

MR. JOHN W. ROBINSON: We have a traditional system at Nationwide and, at certain points in time, it's necessary to do what we call a complex change. We may end up having to cancel the policy and reissue it. Do you take the approach that your system will handle all possible transactions, or do you take the approach that you're flexible enough to add functionality as the need arises?

MR. CUTLER: That's what we're hoping. I know of a system that forces you to cancel one policy and issue another in order to change it. That's what our old system did. We are not going to have that. We are going to be able to make all the changes on-line. Each function will have its own history, so that once we perform a function we can then perform another function right after that and still change the previous one if we need to. This was one of our major criterions in designing the system. We did not want to have to terminate and reissue a policy. This way we have much better communication with the policyholder. With our old system, once you removed a policyholder, he or she was gone. You had to reenter the information from a hard copy record.

MR. MATEJA: At The Hartford, we are developing a front end to a core administrative system. So we have to look at both pieces separately. At the front-end level it's very flexible. I've read pages and pages of rules for various issues. We've tried to be comprehensive. We've polled large numbers of customer service representatives to identify common questions and issues. We've decided how to handle each one of them. The architecture is flexible enough to easily add to the front-end rules in the future.

RECORD, VOLUME 21

MR. DUGAN: The key there is that what you need to do is get your systems to the point where they can evolve. They're never going to be perfect. You have to identify high-value pieces and get to the point where you're in an evolutionary mode.

MR. FRANKLIN C. CLAPPER, JR.: I'm wondering how, as actuaries, you get the political clout to be so intimately involved with the development of an administration system.

MR. MATEJA: In my case, the answer is very short because there aren't any actuaries involved. The amount of time that I've spent on this is probably 50 to 75 hours in the year that I've been at *The Hartford*. The important thing is to identify when you need to be involved. After I started, I got copies of most of the available project material and I read it. I asked many questions and after that I stayed out of the day-to-day effort unless someone had a specific question. I get asked about specific product features or calculations. A typical question might be about how to handle a certain withdrawal privilege. That's been the kind of support that I've provided. Whenever a project summary package comes out, I review it. I've been involved primarily in management reporting. I think the key is to pick your spots carefully. We do have buy-in at the senior management level at our company and through to our parent for this project. There are regular meetings at the senior level on the status of the project. So there is a fair amount of support there.

MR. HEIDORN: You mentioned that you're using software to do some testing. Does that mean that whatever your main system is using, you have another set of programs for testing?

MR. CUTLER: We wrote test calculation software by using either a spreadsheet or, in some cases, a duplicate program, that will calculate the cost of insurance, the monthly deductions, and things such as that. This way, we could do exact checking. All these routines were written independently by the actuarial department. We're ready to test the current phase of our system next month. This includes issuing new contracts, which means producing the schedule pages required by each state, and we will test the cash value routines and the nonforfeiture calculations.

MR. HORNBERG: I have a couple of questions. Alan, instead of storing values such as reduced paid up or cash values, it sounds like your system is storing the parameters and you're actually calculating values on the fly.

MR. CUTLER: No, the dividends are being stored as dividend scales. We're calculating the dividends first and then loading them into the system as rates per thousand.

FROM THE FLOOR: For each possible set?

MR. CUTLER: Yes, we will have data by duration, and it's going to use a lot of storage space. We thought about doing our cash value calculations from first principles, but the problem with that would have been that we'd be writing calculations. Our feeling was that, for traditional products, we should calculate values once and store them.

FROM THE FLOOR: Once a system such as this is developed with a consulting firm to help develop an in-house system, who actually owns the system? Your systems sound

## SUCCESSFULLY MANAGING SYSTEMS DEVELOPMENT

great. What's the potential for affordability of the system? Can it be sold from USAA to another company? What are all the rules and how do people feel about that?

MR. CUTLER: In this particular scenario, that's actually a very interesting question. USAA has done so much of the work from a core administrative standpoint. USAA and Andersen are discussing the potential opportunities that you've just laid out.

MR. HOWARD PAUL HINES: Mr. Cutler, you mentioned a model company. Was that model company remote from your life site?

MR. CUTLER: I wasn't there when that was going on in the last phase. I believe that it was just a production system that a limited number of users had access to. The data on that system were the same data that were on our other administrative system. In other words, they converted the data and let them sit there, or they took new contracts that had just been issued on the old system and issued them on the new system. Then they administered the contracts and checked the values. We were checking for user friendliness in this system. How difficult was it for a user to do a certain transaction? This is assuming that the system has already been tested before so that we know that everything coming out of it is correct. We were more interested in how the user felt about it.

FROM THE FLOOR: Under this test scenario, if people called up and asked for their cash values, would they not look to the model system then? Would they look to the old system?

MR. CUTLER: Well, they would simulate somebody asking a question, or that they had a call for a cash value. To test the system, you can think of the process as playacting.

FROM THE FLOOR: I'm not so concerned about a model system. I'm more concerned about what happened to your production system while you had this system running.

MR. CUTLER: The production system was up and running at the same time. We plan to convert from the current production system to the new system in stages. We're going to take certain products and convert those at one time.

MR. DUGAN: Howard, just to follow that up, the model company that Alan talked about was an effort that the project team that developed HAL took on, and it was part of its rollout. So production was still going on, but the project team took some time on the side to run the model company in parallel.

FROM THE FLOOR: Oh, I see. So it was all simulated in that sense.

FROM THE FLOOR: I think you mentioned a benchmark of not more than a month-and-a-half to implement any product. What if the product is completely new, a brand new concept, such as some new type of dividend option on a whole-life policy in which you get some type of bonus at the end of five years? How would your benchmark fit into that?

MR. CUTLER: We work with the product development area when they're coming up with a new product. We had to implement a new level term product to comply with New York regulations because the old level term product didn't fit those regulations. We had

RECORD, VOLUME 21

that product in production in less than six weeks. We had to stop selling the old product in all the states that approved the new one to save the strain on surplus from the old product. We were lucky because we figured that if we had kept the old system, it would have taken us a couple more months to get that product in place.

FROM THE FLOOR: Does that include the valuation of the new product?

PANELIST: No, the valuation is being done on a PC now. We produce an extract that goes into the valuation system.

MR. ROBINSON: Would you comment on how your system is documented?

MR. CUTLER: We have a whole area of the company that documents procedures. By the way, there will be on-line user help. Right now it's on the mainframe, but, of course, eventually it will be on a client-server basis. In other words, if a user has to make an entry on a screen, he or she hits the F1 button and that brings up a help screen, showing every value that the user could enter. Of course, we have complete documentation of the design. Every process is completely spelled out, and we have all the flow charts and specifications so we've kept extensive documentation of the whole system.

The analysts who did the design wrote it. In other words, this was done at many levels. The design process was performed in many stages. It was very high-level design and it got more and more detailed until it came down to the very final detail. The programs are written from the detailed design.

MR. DUGAN: There are two kinds of documentation. There's user documentation and there's technical documentation. Generally, I think you find that the on-line tools provide a baseline capability to help. In The Hartford's case we have put in a second level of help to provide on-line product reference for telephone support.