

The Importance of Evaluation in Health IT Implementation: Practical Advice for Providers and Healthcare Organizations

May 15, 2008

Good Afternoon everybody. This is the AHRQ National Resource Center for Health Information Technology's Webinar on the Importance of Evaluation in Health IT Implementation. My name is Erin Grace and I work at the Agency for Healthcare Research and Quality. I am a member of the Health Information Technology Team and I will be your moderator today. Before we get started, you should be seeing on your screen a short survey that we would like you to please complete. It gives us some good feedback in terms of how quickly and easily you were able to access the webinar. We will also be giving you a survey at the end that will be related to the webinar itself.

I think we have an exciting group of presenters here today on a very important topic. Again this is the National Web Conference on the Importance of Evaluation in Health IT Implementation: Practical Advice for Providers and Organizations. Our three presenters today, in order of their presentations, are Julie McGowan, Cait Cusack and Fred Lord. I have a bit of information about each of our speakers, so I will introduce them all at once and then we will get started with the presentation.

Julie McGowan is a Ph.D. and Associate Dean for Information Resources and Education Technology and Professor of Knowledge Informatics and Pediatrics at Indiana University. Her research includes evidence utilities in decision support, economic impact and human factors, and telemedicine technology implementation, and tools and outcomes of medical informatics education. Dr. McGowan serves as co-principal investigator of the 13 Indianapolis IAIMS initiative and has been on the IAIMS board for more than 10 years. Formerly, she was an Associate Dean at the University of Vermont where she also served as co-principal investigator for the Vermont IAIMS project. As the Principal Developer of the Vermont MedNet, the nation's first comprehensive state-wide health information network, Dr. McGowan received the 1996 ISI Frank Bradway Rogers Award for Information Advancement. Dr. McGowan has extensive experience in both planning and execution of integrated information systems from the user's perspective. She will be starting out our presentation today on evaluation.

Our next presenter will be Dr. Cait Cusack, HIT Program Manager, who plays a variety of roles with the National Resource Center, including providing oversight of the project as a whole and acting as the lead for the Value and Evaluation team. In addition, she is a member of the teams that provide content to the NRC website and that provide direct technical assistance to those receiving AHRQ funding. She brings a unique combination of skills to the project, including a robust clinical background in women's health. She has broad Health IT experience and experience in project management, healthcare consulting and patient safety. Dr. Cusack is a board-certified Obstetrician/Gynecologist with 8 years of clinical experience and holds a Master's Degree in Public Health from Harvard in Health Policy and Management. She will continue the discussion of the practical advice for providers and healthcare organizations.

We are very privileged to have with us Dr. Fred Lord, who is going to be able to give us some information on how he has been doing evaluations related to the project he is working on, as well as how he has been able to use the evaluation toolkit to help him with that. We will have some real on the ground experience of using these tools in a real project. Dr. Lord is Vice President of Medical Affairs with Rural Health IT Corp, which is a consulting firm that assists clients with grant funding, project development and implementation, and he is also a practicing addiction medicine physician in Windsor, Vermont and a former AHRQ PI as well as a current consultant to the Mount Ascutney Consortium grant project in Windsor, Vermont. He is also newly appointed as network coordinator for a HRSA grantee in Brevard, North Carolina.

I think we have a great line-up of speakers here and without further ado I will turn it over to Julie to begin the presentation.

Thank you, Erin. Welcome. What I would like to do is begin this introduction to evaluation with a conundrum and I would like you to start thinking about this to lay the groundwork for your evaluation. There is definitely a need to provide complete evidence of the effectiveness of health information technology, but to provide that evidence you really need to have a complete and convincing demonstration. However, to provide the complete and convincing demonstration, you also need to have good programs. And if you think about the various things that you want to implement, there is a logical approach. However, to provide the good programs requires both well-trained personnel, professional rewards, and a good computer system. But to get the well-trained personnel and to get the good computer system, you need adequate funding. Where do you get the adequate funding? You get the adequate funding if you are able to provide evidence of its effectiveness. That really lays the basis for the whole concept of evaluation of implementation because when we think about evaluation, most people think about research. But really we are not talking about research. HIT implementation does require formative evaluation for success, and hopefully I will build the case for that in the next few slides.

One of the reasons that you want to evaluate is because it is generally locally supported and you need to address those outcome needs. When your CFO says, "Is this a return on investment?" you need to be able to prove that it is there if that is one of your priorities. Also, evaluation needs to be process-based, whereas research will really look at the outcomes of the HIT implementation, and there is a difference. So when you think about evaluation, it doesn't necessarily mean research. The whole concept of research generally scares a lot of people away, unless you are in academia where you are expected to do research. But, research is sort of that gold standard and evaluation is critically important, but it takes a different tact.

So the first thing you need to do when you are thinking about evaluation is decide for whom do you evaluate? You need to define who your stakeholders are. So your stakeholders could be the funders of the HIT project if your funding group is the federal government, state government or whomever, but it could be local. You are going to have to think about your stakeholder as your hospital, your health care organization. Also, think about the funders of continued maintenance, which will be your own organization. Your stakeholders are also the users of the HIT system, but they can also be the community.

So what do you evaluate? Generally, there are three different categories of evaluation: the first of these is technology, then you need to think about human and organizational factors, and lastly finance and return on investment. In terms of technology evaluation, the first question you have to ask is: Does it work? Is it reliable? If you turn on a system or you go to your computer and it takes 5 minutes for it to boot up, the users of that system are not going to continue using it.

Then you look at performance metrics: how long does it take you to get that very critical lab result? And standards and interoperability: Are systems able to talk to each other or do you have to log off and log back in to a new system if you need to get decision support after you receive that lab result? There are certain trade-offs with customization, so if you get a system that is off the shelf, but then you try to make a lot of modifications, you might lose some of the functionality of the originally purchased system. And, of course, look at the usability: is it easy to use? And the usefulness: does it meet the end user needs?

When you think about human and organizational factors, you need to look at both the adoption and the attitudes of the providers, the people that are actually using the system. You are going to have some early adopters and you are going to have some luddites. But essentially what you are interested in is understanding those before you begin the implementation process because then you can address them on the front end. If you come up with some issues that happen – maybe you are not getting the level of adoption you hope to achieve – this is part of the formative evaluation: do a survey, find out why you are not getting the use and then you are able to tweak the system to meet more of the user needs.

You also need to think about patient knowledge and attitudes, and this is not just if you implement a personal health record, but patients can influence the adoption of a system by the primary users of the system. If patients don't have to provide information three times at three different areas – if they are able

to just get one particular health care record with all of their demographic information entered at one time and when they are sent to radiology they don't have to re-enter it, they are going to think very highly of your organization, so that is something to think about.

Workflow is one of the things that most frequently causes implementations to fail. If you don't address current workflow and look at ways that the system can enhance workflow, then you are putting the onus on the end users to adapt. So when you are doing a formative evaluation of workflow, you look at ways that you can improve the workflow through the HIT process and the evaluation will inform that change. You also need to think about process change, both from an efficiency perspective and from an effectiveness perspective.

When we get into finances and return on investment, obviously you are going to have to consider the capital costs, which are going to be a major expenditure for an organization. These, of course, can be amortized, but these need to be considered, along with the implementation costs of things like training and process reengineering over time, compared against the anticipated benefits. The benefits are perhaps improvement in the ability to communicate with patients, perhaps improvement in turnaround time, but what you need to do is also ask who is receiving the savings, and it might be that the savings are being received by the patients, in which case the patients are the beneficiaries. This is not necessarily a bad thing for the health care organization since it could improve your catchment area and get you more patients that then can offset costs in a different way.

Now obviously you are looking at a gold standard because you want to improve patient safety and look at the quality of health care, but it is very difficult to do that during the implementation process. This is where you are taking that next step into evaluation of outcomes and that can really only be done once the HIT system is already implemented and it is 100 percent operational and people have begun to use it. So what are we looking at in terms of outcomes? Usually there are three different areas that these fall into: medical errors, patient care and population health. When we are talking about medical errors, most people that do the outcomes evaluation are looking at provider order entry and reduction in medication errors. They can also look at medication reconciliation, handoffs, and discharge summaries. Those are the four major ones, but there are other ones that you can look at. That's when you brainstorm with your health care providers and find out what kind of clinical outcomes are important to them.

In areas of patient care, you can look at guideline adherence, because that should achieve better outcomes in patient care; clinical decision support systems: does this prevent medical errors?; rapid access to medical data – if you are trying to make a decision, are you able to get those lab results back a lot more quickly? You also need to consider things like quality of life management for chronic illness like diabetes. Again, there are many others that you can consider.

In population health, really you are looking at management of chronic illness, as I mentioned before, but then also the impact of RHIOS, the regional health information organizations. If you are working with the health department you will want to consider things like modeling bioterrorist events and public health disasters, such as emerging infectious diseases. The bottom line is health information technology implementation definitely needs a formative evaluation process to help make sure that the outcomes of the implementation process are what you expect and to be able to ensure that you can make those rapid changes that can help it be successful. Research does need to be based on health care outcomes, but it particularly needs to be based using operational health information technology systems. The ultimate goal is widespread acceptance of Health IT and that will only come from both the evaluation, or the process, and the research outcomes. I will now turn it over to Cait.

Great, thanks Julie. I am going to spend a few minutes talking about one of the tools that the National Resource Center has put together in order to help people along with evaluation. This is the National Resource Center's Health IT Evaluation toolkit. The Evaluation Toolkit came about in response to a need. The NRC began by providing direct technical assistance to those who were funded by AHRQ in Health Information Technology. One of the requirements of many of those AHRQ funded projects was to

develop an evaluation plan and to evaluate the projects that they were getting funding for. We received many requests for technical assistance around evaluation.

When we first started out in this whole endeavor in giving direct assistance to people doing evaluations, my first response was to try to go out and find a resource that I could hand to grantees and say, "just read this book and you will know how to do it" in order to reduce the amount of necessary one-on-one technical assistance in evaluation. When I did my initial search, I found a tremendous breadth of evaluation literature out there, but most of it is theoretical and academic and not really hands-on practical. I didn't find what I was hoping to find, which was something short and easy to send to people to help them on their way with evaluation.

Because of this, the evaluation toolkit came to be. It is intended to be a very basic step-by-step process of how to think through what you want to evaluate and how to determine how you are going to do the "how" of what you evaluate. We joke about the evaluation toolkit as being an "Evaluation for Dummies" because it is meant to be very practical. The toolkit is set up as a workbook: it is broken down into sections, with headings, questions, and space in the toolkit to write your answers. There are also examples around each of those steps.

We feel that the toolkit works best as a tool in a brainstorming session. When you do these brainstorming sessions we recommend that you pull together people who know the project itself really well: bring together your stakeholders, as well as your evaluation team, because frequently those doing the evaluation are not those that are intimately working on the project itself. We always recommend that you bring an IT person on board as well – we have had a lot of people try to measure things in their implementations where their systems don't collect the needed data. When an evaluator goes to collect the data, they can then discover that they can't get back out of the system the data that they are looking for.

So you bring together that group of people and work your way through this workbook. The toolkit is broken into the following sections: it starts off by having your group think about what the project is about and describe the project, and think through "What is the implementation about?" Or if you have already implemented: "What is being accomplished by the project itself?" in order to think through what the goals are of that project. Typically people have implemented systems for a reason: they want to get something back out of it, they want to see that ROI and save money, or they want to improve patient safety-- there is some reason why you undertook the project in to begin with. You want to think through what the goals of doing an evaluation are, and what you are hoping to get out of doing the evaluation: are you trying to write a report or, again, get that ROI as Julie was talking about?

The toolkit then has a section on how to go about choosing what you are going to measure, and then the toolkit walks through how to draft a plan around each of your chosen measures.

Julie has hit on most of this already. The toolkit has an entire section dedicated to listing out potential measures that you could measure. So if you think you want to measure that clinical outcome, but you aren't really sure what kinds of things you could be measuring, the toolkit lists many different candidate metrics. We cover six categories including: clinical outcomes measure, clinical processes measures, provider adoption and attitudes measures, patient knowledge and attitudes measures, workflow impact measures, and financial impact measures. For each of the sample metrics that we give and we list, we also talk about what your data sources might be, talk about what the relative cost of undertaking that given measure might be, and we talk about potential pitfalls – where you might fall down in trying to approach a given measure.

Again when you sit down to consider what you are going to do, I highly encourage that brainstorming session methodology, with bringing all of the stakeholders to the table. You want to ask "If we are to say we have met our goals of our project or met our goals of the evaluation, what would we have to measure in order to be able to say that?" We encourage people initially to just throw out anything they can think of that will help them determine if they have reached their goals. Then the toolkit has a process for

eliminating those metrics that aren't so important or feasible, to try to bring you down to 3, 4, 5 things to measure at most.

After you as a group have thrown out a number of things that you think you could measure to help you say you have met your goals, we first ask you to think through what is important to be measuring. Ask the group to number on a scale of 1 to 3: 1 being very important, 2 being moderately important, 3 being not important at all. This exercise of thinking through each of the measures, about whether or not they are important to stakeholders, will force the team as a group to stop considering those things that aren't so important. What I found in groups that I have worked with in helping them think through what they are going to measure is people get very passionate about what they want to measure and they don't want to let go of their item: you will get somebody where something is very, very important to them. This exercise as a group helps to filter out things that are not collectively important and level the field amongst everybody who is involved with the project and who is interested in the project.

The next thing is to think through which things you are considering to measure are actually feasible to do. Again, people get passionate about what they want to measure out of a system. For instance, you might want to say, "well we think this is going to reduce mortality and we want to measure whether or not the system impacts mortality" and you might not want to let that go. One of my favorite examples is that I had somebody that was going to measure mortality in a very small rural hospital in Maine and we realized that you would have to measure mortality for years and years because they just didn't have that many people die every year-making it an unfeasible metric. For each measure give a 1 for feasible, 2 for feasible with moderate effort, 3 for not feasible. When doing this consider for each of the measures do you have the people to measure this metric, do you have the money to measure this metric, is there the space? When you are doing something like a chart review, you have to have physical space to do that chart review. Also, is there time to get at it? Do you have the adequate sample to make that feasible? You want to think through whether each of the measures is actually doable. We have lots of examples where people start measuring things that are great things to measure and then get most of the way through a project and realize it wasn't actually achievable from the beginning, either for money reasons, time reasons, people reasons, space reasons -- it just wasn't doable.

After you rank every measure that you are considering you can put the measures into the importance and feasibility matrix for the toolkit that we developed. Our next speaker, who is one of the grantees, is going to talk about how they used this matrix. It is pretty effective because it gives you a very quick visual of what needs to drop out of your evaluation: anything that hits the red areas is neither important to your stakeholders nor feasible and shouldn't be addressed. Your green zone, that number 1 box with items that are feasible and very important, is the sweet spot for your team. The hope is you will end up with 3, 4, 5 metrics that will land in that box -- this is where you should concentrate your efforts. If you find that you don't have enough measures in that first box, then you want to go to box #2, very important and feasible with moderate effort, then box #3 and so forth. Hopefully you will get enough in the green. I can't emphasize enough how important it is that it is far better to do just a few measures really, really well and have something to say at the end of your evaluation, than to embark on undertaking a ton of things to measure that you never quite finish and end up with nothing much to say at the end.

We do have people that end up going into those yellow areas because they determine they have enough time, people, and financial resources to do that, but again our feeling is stick with the green if you can. In addition to listing all of the different measures in the six categories that you can go after in that workbook format that you work through, the toolkit also has examples in it, including specifics around pharmacy implementations, barcoding, ambulatory CPOE and telemedicine.

In addition, there is a second toolkit that the National Resource Center created. Shortly after the first toolkit came out, we had a number of health information exchange projects looking for assistance with evaluation as well. We sent them our original toolkit and they universally said "this doesn't apply to us" and, of course, the reason for that is that our original toolkit is hitting things around outcomes and impacts at a pretty granular level and, when you are doing health information exchange, you are almost up a level -- you can't initially get at clinical impacts early in data exchange projects. We therefore created a second toolkit around data exchange in the same format: it is laid out as a workbook; it is divided into sections

with questions with room for your team to write answers down and examples around those questions. The focus, though, is totally on exchanging data.

This second toolkit gives a number of metrics and also has data exchange examples that you can refer to. The way that we broke down the metrics was to consider things that you could measure around exchanging data between providers and laboratories, providers and pharmacies, providers and providers, providers and radiology centers, and providers and public health departments. Some of the examples of metrics here are things like: are you actually exchanging data? How many data elements are being exchanged? Are people signing up for your health information exchange and, if they sign up, are they using it? If they signed up and are using it, do they come back? Are there repeat users? Is there a reduction in the number of labs being ordered and an impact there? There is a very robust list of things that you could be measuring in health information exchange.

The toolkits were both developed because we kept getting requests on “How do I do it? How do I do it?” and we didn’t have a good place to point people to, a practical way of doing this. So we created them, and we’ve gotten a lot of positive feedback on each of the toolkits. Links to the toolkits are on the slides. I’m now going to hand this off to Fred, who is one of the grantees that has done evaluation with his project, and he is going to talk some about how they implemented and used the toolkit.

Well, thank you and it is a pleasure to be here. I am going to be giving a lot of information that I presented at the HRSA conference last fall in Kansas City and I have to give some credit to Mr. Tom Sims, who is our current PI on the grant project that AHRQ is funding at Mt. Ascutney Hospital. I learned almost everything I know about evaluation from Tom - he is a real bright guy and I am very grateful to him for a lot of his help with this.

As Julie and Cait have said, evaluation is not just about figuring out how you did when you get done, really, evaluation starts with the planning process. Evaluation helps your planning process because it allows you to do the things that Cait and Julie both talked about: establish a concept of what has been done and try to figure out what exactly it is that you are trying to solve. A lot of times, the problem that you are trying to solve may not be amenable to an IT solution, you may not need to do all of that and the problem could simply be training, workflow or documentation, things that can’t be fixed with a computer. Simply throwing the computer or computer program or software at a problem, as you well know, is not something that is going to work – the problem needs to be solved ahead of time as far as workflow and things are concerned and not simply have an IT solution thrown at it.

What we looked at when we started our project was trying to figure out what functions of the system was the system going to be required to perform, and what is it that is actually missing from the milieu to make a particular task possible: is it an application? Is it a database? Is it something else? And what are our goals? How does the new hardware or software make the performance of the task either easier, faster, more accurate or more thorough? And what is it that needs to be done? How is it done now? What has to change to make converting the task to an electronic format work in your particular milieu? Does the application have to change, do the users have to change or, more frequently, is it a combination of the two? This is a direct quote from Tom Sims: “People, processes and technology direct the problem. If you can’t identify which of these, if not all, is the problem, even evaluation will not help you here.” So you need to figure out what you are doing first.

One thing that we figured out was that what we were trying to do was to enhance and not necessarily change the work process. There are some things in your work process that may need to be changed in order to make what is happening in your organization work better, but if that is the case then your IT solution must support the change, not drive it. As Julie said, if you are going to just hand a software solution to your people and expect them to change everything that they are doing in order to make this work, then it is not going to work. It is just not going to work.

As an example, look at the system that you are thinking of implementing: there are some places where you have to fill in a particular box in a program in order to progress to your next task. If that functionality is not useful for the task at hand, if the people that are going to use your system don’t think that it is a

worthwhile thing -- if it isn't giving them more information, if it isn't making their lives easier -- then they are not going to use it and it is going to cause a revolution, so that isn't a good thing.

Your first evaluation step, as we have said, is to get consensus of the desired outcomes of the project and you have to foster user buy-in: everybody has got to be on board or it is not going to work. The evaluation plan actually helps you figure out and focus your goals and give the project some form. We used survey monkey, a very useful tool, to design a survey to find out what is important to people, what they think, what they like, what they don't like, and what they are scared of, which is extremely important. These are a couple of screen shots of the various things that we were interested in measuring and the results that we got. In addition to a scale, we were able to allow some open-ended questions and get some results. My favorite is number 13: "I think Penchart is just plain poorly designed," Penchart is the electronic medical record system that we used, "It tries to think for us by providing templates. These templates actually reduce the quality of our notes and you never know fully what a provider really saw." Well, that is the kind of thing you can get out of this if you are fostering user buy-in.

In the ongoing project, the process evaluation allows for monitoring of progress of your implementation. It allows troubleshooting of your glitches and identifying pitfalls as they happen so that you can fix them before they get huge. In your outcome evaluation, did you do what you set out to do? How did you do with it and how are you going to measure it? Are you going to use a Likert scale, are you going to do qualitative versus quantitative management? And you can figure out how you are going to analyze things.

So with that as a backdrop, what we did was we tried to figure out: What is the point? What are we trying to do? We tried to figure out our goals and the measurement of the impact on specific areas. We chose our metrics and we did so using the toolkit. Once again, here is the website: www.ahrq.gov. If you can't find it, this is the actual URL for the evaluation toolkit itself:

http://healthit.ahrq.gov/portal/server.pt/gateway/PTARGS_0_3882_81659_0_0_18/AHRQ%20NRC%20Evaluation%20Toolkit.pdf

So, we sat down, we brainstormed, and we figured out these were the goals of our project, and there were a lot of them. I am not going to read through all of them, but this is what we decided we wanted to have happen. We then were looking at the technical impact, the human impact and the business case, which is another way of saying what has already been said, and decided how to determine our qualitative measures. So under technical impact, these were the things we wanted to have happen: we wanted data availability, data from all systems accurately displayed, accurately synchronized, and so on and on down the line.

For the human impact, we wanted to make sure we got provider adoption. In terms of usability, we were implementing a PAC system as part of this project and we wanted to make sure that the quality of images were up to snuff for our radiologists, and that everybody was happy, including the patients, which meant reduced time in the waiting room, more provider/patient interaction, reduction of adverse drug events, accurate medication and allergy information available at the point of care, and then improved visit cycle time.

For the business case, this project started because our administrator's 90 year old mother got upset because she had to register three different times in three different systems at our hospital and our administrator, being the good son that he is, decided that he needed to fix the problem and dumped it in my lap. But, this was the start of the business case: reducing the provider time on task, reduction in travel by our remotely located radiology group – we have a 5-person radiology group providing services to 4 different hospitals and when one person away at a CME and another is down with the flu, then they have a problem, so we wanted to make sure that their lives were made easier.

This slide shows our metrics: this is what we decided to measure, and we numbered them one through eight. Our human impacts we numbered nine through sixteen, and the business case was seventeen through twenty-one. We also had our qualitative metrics, which we got off of the survey monkey, in addition to all of the other impacts. Our Emergency Department doctor was upset because he didn't access the medication list because they were found to be inaccurate; a clinic doctor found things just too

time consuming and he doesn't access data in another system because it is too difficult to learn; communications systems aren't efficient; another doctor is falling behind on all of his visits because he is waiting for documentation to be gathered from other systems; the built-in canned reports were not comprehensive enough for our clinic manager. So we took these qualitative metrics and we identified some themes that we then wanted to include in our plan.

This is what we came up with: the very important metrics were these numbers, our moderately important metrics were these numbers, and the ones that were not so important were as follows. And then which ones could we actually do? Well, we again divided them up, as Cait mentioned, and we put them into our matrix: the ones that were really important are in the green and those are the ones that we tackled first. Then we went for the ones that were very important and able to be done with a little bit more effort, the moderately important ones that were easily feasible. We figured out that numbers 7, 8, and 15 might have been important, but we just couldn't do it and even if they were feasible, they just weren't important and we weren't going to waste time on them.

That is how we went ahead and developed our plan as to how to attack things and that is how we used the toolkit: by listing things that we thought were important, listing things that we thought we could measure, and then coming up with the metrics and figuring out where on the pecking order they should be. Then, we used the toolkit and the matrix to figure out how we should do things. The other thing that we needed to figure out that this helped us with is: What is reasonable and how can your project actually be turned into something that you can make work? The people who draft your plan ought to be knowledgeable about what is feasible and what is not, obviously, and the goals and objectives have to be realistic and the treatment and the matrix is actually very good for that.

A very good example is one of the proposed goals was: "Regular clinician and training sessions will begin throughout the Consortium." Our team member and Principal Investigator replied, "at first blush, this is impossible...This is a whole project just by itself. I know this is a goal that needs to be pursued and I agree with it, but for practical and logistical reasons, I think this ought to be moved WAY down the list and stretched over multiple quarters. Otherwise, anyone who reads this is going to think we've been into the mushrooms again if we don't do that." So, this is one example of how we used our evaluation plan in order to try to prevent somebody from going off tilting at windmills.

Overall, we had our general considerations, our timeframe, our study design and comparison group, we had our data collection plan, we developed an analysis plan and we figured out our power and sample size calculations. I wish I could give you all of those results but our process at this point is on-going, and hopefully in another year we will have results to show people. That is where I am, thank you.

Okay, thank you very much. Thank you all very much for your presentations. We heard from Dr. McGowan the reason to do evaluation and the difference between evaluation and research. Cait gave us some practical examples and overview of the tools that are available through the National Resource Center, and then Dr. Lord gave us the real world example of using those tools. I think all of those were very helpful pieces of the presentation. We have time now for some questions, and the questions can go to any of the panelists or to all of the panelists.

Dr. Lord, I will start by asking you a question: You laid out how you used the toolkit and followed it. You made it look very simple, but I know this isn't an easy process, so I am curious if there were any particular challenges in developing your evaluation plan?

Well, first of all, getting everyone to sit in the same room is next to impossible, so we didn't even try to do that. That was one of the reasons why we decided to use the survey monkey, because even though it isn't as good as sitting in a room and being able to brainstorm and put things up on the blackboard and argue and really hash things out, it is a really good way to reach a lot of people over a relatively short period of time and the effort on the front end is relatively small, in that you design your survey, you send it out and then for the survey period your effort is spent flogging people to fill out the survey, which is an awful lot easier than trying to schedule and re-schedule meetings and deal with an unruly crowd. The problem with that is then on the back end, you have to sort of collate and analyze the results, and that

can be a little bit more daunting. If you have people who are accustomed to doing that and capable of doing that, then that makes it a little bit easier. We have used this tool in a couple of other places and have been able to get reasonably good information, particularly with regard to facility-readiness, user-readiness and trying to figure out where people are, for instance, with computer literacy. We have been able to find out who actually has access to medical records, who doesn't; who has a clue with regard to what we are asking them to do, who doesn't have a clue; what training are we going to have to provide; what are we going to have to do to get ready for all of this, so that is one place where the tool is extremely useful.

The other advantage of the survey monkey is that you can have a smaller group that can then go through the responses and come up with the evaluation plan, as you saw, and that is exactly what happened. When our evaluation plan was being put together, I was doing my fellowship in Florida and was participating in the meetings by phone conference. It is not the same as being in the same room, but we were at least able to get people together and talk about these things, everyone could see the stuff up on the screen and be able to do it. So, it does make it a little bit easier to get things done and that is why we decided to do it that way. The biggest challenge is obviously to get people to agree and, as Cait and Julie both said, people are extremely passionate sometimes about what they think ought to happen and some people are regrettably somewhat naïve about what they think ought to happen. Being able to use this tool in order to prioritize things is a very useful exercise.

Thank you very much. Now the questions are rolling in. The first one is: If you could give a brief overview, Dr. Lord, of your Health IT implementation project that you have been describing the evaluation process for. One question related to that is: When did you start the evaluation process and how long did each step take? Did you wait until you had implemented the HIE or did you start evaluation at an earlier step?

First of all, we started the evaluation on September 1st when the grant period started. In fact, we actually started the evaluation plan during our planning grant, but don't tell AHRQ that. The project that we have is with Mt. Ascutney Hospital, which is a critical access hospital located in Windsor, Vermont. We are about 25 miles from the Dartmouth-Hitchcock Medical Center, which is a tertiary care center and there is a private radiology group in the area that contracts with our hospital and three other critical access hospitals, all three of which are on the New Hampshire side of the river, we are right on the Connecticut river right on the border of east-central Vermont. So, we have a radiology group and our tertiary care center.

Our project involved using a clinical overlay system to pull together all of the disparate information systems in our little hospital so that people could get information on one desktop or one area from each of these different systems, so they could access patient data within the hospital in a clinical context so they didn't have to keep logging into each system. Also, we wanted to be able to pass information through an integration engine through a couple of systems where that needed to happen. Once that was on its way, then each hospital in the area implemented a PAC system and our next step is to pull the PAC system into the portal and then connect through our portal to the clinical information system at the tertiary care center and also give their doctors access to our information so that there is a bi-directional flow of information. We are trying to basically put together a small HIE and that model has actually now expanded into the entire state of Vermont -- the Vermont Department of Health is using that as a model for their Blueprint for Health using similar software to do that.

We knew that, even in a small hospital, the evaluation plan was going to be a big deal and we started the evaluation right off the bat: in order to figure out what we wanted to implement, we needed to know what people wanted to do and we knew that we were going to have to be able to tell AHRQ how we did and what we did. Our project is up in September of this year, and as far as how the timeline works with the different steps, I have stepped back a little bit from the project and I wish I had Tom here to tell you how things were going. The first step, getting all of the systems put together, took between a year and a year and a half or so. I think they are still going through everything to try to figure out who is happy and who is not. I think, for the most part, the provider acceptance has been quite high and again it is still an ongoing process, we are still working on the project so it is a little early to be able to tell final results.

Great, thank you very much. I'll move on to the next question, which I think any of the panelists can answer. The question is: How much to budget for costs involved in evaluation? How do you convince decision-makers that this cost is worth it?

I can take a first crack at that. It depends, obviously, on the level of your evaluation. If you are going to do a very, very comprehensive evaluation and hire an evaluation consultant then obviously there are going to be fairly substantial costs. However, one of our colleagues, Eric Poon, put together a program called "Evaluation on a Shoestring" that is available on the AHRQ website.

I would also refer you to a recent article that Cait and I wrote in the Journal of the American Informatics Association that talks about the need for evaluation. That really addresses the need to put money into formative evaluation because it gives a lot of anecdotes about how HIT projects fail because they were not substantially evaluated. So, it's sort of a chicken and egg: most people say, "well I don't want to put money into it," but if you don't, then you stand a greater risk of not being able to bring your evaluation project and your HIT project to a successful conclusion. The other piece that is the mantra that you go forward to your administrators or your CFO with is: you have goals for this project, these are the goals, and how are we going to see if we've met those goals without doing some type of evaluation?

This is Erin from AHRQ. If you are looking for a ballpark if you are applying for a grant, for example, to spend 5 to 10 percent of your budget on evaluation is probably not unreasonable. Fred, maybe you can give us the reality check here.

Well, to be perfectly honest with you, I don't know exactly what it cost us to do this because the salaries of the people who were working on the grant were supported, in part, by the grant. We knew we had to do it, so we just did it. I would go even a little further – Jeff Rose, in his book on information technology, talks about how anywhere from 35 to 50 percent of HIT projects in the country are failing for one reason or another and I think if you don't do this, then you are bending over with a big sign that says "kick me" because it is not going to work. It is foolish not to have some sort of a roadmap for where you are trying to go and the evaluation plan is not just something that you can use at the end and say "here, here is what we did." That is not the point. The point is to use the evaluation plan to guide how you are going and it is sort of like being able to use a map and compass or a GPS system so that you can see where you are going and see where you are supposed to be. You'll know when you are getting off course and you can fix it before it becomes a huge problem. If that isn't enough, if you don't have a good evaluation plan and you are not able to give solid information to your grant funding organization at the end of your grant, then they are going to want to sit down with you and have a long talk with you with arched eyebrows, and that is not a situation I want to get into, thank you.

Those are some excellent points and I think it actually addresses one of the other questions, which was: when evaluating Health IT outcomes, is it best to focus on a 6-month period after implementation? I think based on what you just said, no -- for an evaluation to really be effective it should be helping you all the way along.

Erin, can I just add a couple other points to that? I'm sorry, go ahead Cait. I was just going to say, one of the arguments that you can make to the people that you have to get that money from is to think about it from an external stakeholder perspective as well as what it can do for your internal implementation, but also think about the publicity you can get out of it. That resonates with the CXOs: if we implement this and we show the impact of it, we can put an article in the local newspaper saying "look we are using an electronic health record now, and we have seen a reduction in our medical errors." So that outward focus on implementation does tend to resonate with the people with the purse strings. The other reason for doing evaluation that resonates with your CXO-types is around what it can do for bringing on your late adopters because one of the biggest issues in health IT is that you get these systems in and then nobody uses them. Well, if you have some early wins because you've been evaluated and some early feedback from your users that you can then take to your non-users and non-adopters and say, "look, the physicians are very satisfied with the e-prescribing system, they are saying it is saving them time, they think it is saving them money." It is a way to get more people on-board with using the system. I wanted to throw those things in as pitches you can make to the people holding the money for evaluation as well.

The other thing to remember is this can also be used as a recruiting tool. A few years ago, our radiology group was looking to recruit a radiologist, and it is amazing to me how young doctors coming out of training programs have never actually handled an X-Ray film -- it is all digital. Physicians were coming out of major training programs at this point and they haven't used paper charts, they don't use them anymore in a lot of places. You have to at least be moving in the direction of a good electronic medical record and a good information system. If you have that or can demonstrate that you are moving in that direction, it is a recruiting tool over a place that might not have that, just as an aside.

I would like to stand on something that Cait said in terms of getting more users because if you do the planning for the formative evaluation early enough, then the people that are perhaps reticent about using the system can see that you are interested in their concerns and through that planning process for the evaluation you can actually garner buy-in at the front end because they know that you are going to be addressing their issues.

Thank you everybody. We have several more questions that have come in. The next one is: how do you decide which stakeholders to include when coming up with the metrics? Too many voices can slow the process.

A very simple answer to that is who is paying for it? I would put them at the very top of your key stakeholders. You need to think about the users, obviously, and that is what we were talking about, but when you are talking about too many voices, too many voices at a single table is too many, but if you look at them and take them and group them individually to understand the difference -- say, the people who are using the system, what their needs are; what the administrative and the CXO needs are; what the community needs are and what their perceptions are -- they might be interested in issues around privacy and security. So parse out your key stakeholders and try to understand their needs. Then, there are going to be some common threads and you can craft a single evaluation plan and you can use some of your evaluation to address all of the interests of the various groups. However, you might need to address some individual ones separately.

Thanks Julie. There was another question that was specific to your presentation, Dr. Lord. It says that you mentioned the computer skills of your users and they would like to know if there are any standard instruments that you might suggest to assess the computer skills of users? Or if there are standard instruments to do your questioning?

Well, the short answer is I don't know of any standardized instruments that you can use in order to assess computer skills. What we basically did in our place and what we have done in a couple of other instances is we have found that people by and large fall into 3 groups: the luddites, as Julie put it, or the folks who have precious little, if any, computer literacy skills or who don't have any access to electronic information and don't know how to access it. Then, there is a group with some access, but who really aren't sure what they are doing. Then, there are the people who really get it, the techno-philes, the people who really understand what is going on and those are the people who you are going to be able to get a lot of help from.

But, I think the best way that we have found is to essentially, based on what you are trying to do and what systems you are trying to implement, come up with what you consider a baseline: what do people need to be able to do? Are they going to need to keyboard? Well, if they do, then you are going to need to offer a keyboarding class. Do they know how to access their email? Can they use a word processor? Can they turn the computer on? It is that simple and those are the kind of assessments that you need to do and then you need to design your program around that. Basically what you are trying to do is assess the deficiencies that you have, but I don't know how to do that in a standardized form. Once again, I think you need to figure out what it is that you need people to do and find out if they can do it or not and if they can't, then you are going to have to remedy that. That is the simplest way I think I can put it.

That's great. We have another question here: When addressing the very important feasible goals, do you address them all at one time or one at a time? Is there some other kind of approach? Should all of them

be completed fully before moving on to the very important moderate effort goals? So basically how did you stage your measures?

I'll take that one. I think it is worth taking them one by one and giving that score of feasibility from one to three and just going one by one and talking about the issues. I still think that if you end up with five measures that end up in that green spot, you should stop. If you do your project plan and map it out and decide what it is going to cost you and you think you still have the people and the money to do more, I would try to start those all at once. Although now I am hedging – I am used to working with grantees that have a very discrete period of time where they have to start and finish their evaluation. If you are an organization that could do serial evaluation because you are going to do this over months/years, then sure you could do them serially.

I was sort of reading that from a different way in that once you have identified those feasible goals' importance, do you do them individually or do you do them all together? I would say that is pretty much institutionally and data and metric dependent because if, for instance, you are collecting a lot of data out of a computer system, you don't want to just collect one set of data and finish that particular evaluation component and then go collect another set of data. Collect the data all at one time and then start parsing it.

Great, that was a good question. We now have someone with a question on the phone:

My question is about the role of the vendor in setting up the system to appropriately collect and track the information. Obviously, you need to enter certain kinds of data – the fields, drop down lists, and so forth often need to be customized. I know that sounds easy, but it's usually very complicated. Then, of course, you have to have reports usually and data sets so that someone can extract the data. We are just about to connect with our vendor on our project, and my question is, in your experience, how well do the vendors get this? And do they provide the help in general and what recommendations can you give to enlist the support of vendors, especially in environments where people are not as technologically-savvy and are often on their own to figure out how this all works?

I would say vendors will do anything for a price, but that is probably not the answer you wanted.

You have already selected your vendor, but in your vendor selection process, if you have already identified some of your outcomes, you may want to first ask them, "can we get this information out of the system?" Then always ask them to show you how, because the sales people will tell you, "of course you can," but in reality you maybe can or can't.

That is a very good point.

I think most of the vendors are scrambling at this point and they want to sell their system so if you hold their feet to the fire, tell them what you need and see if they can do that, then you can make the deliverable and not sign off on it until you get what you want. I think that is extremely important. We had a vendor that we were locked into as far as the electronic medical record was concerned and another for the business software. Our vendor was putting in an overlay system to connect all of them and one of the vendors was somewhat less than enthusiastic about cooperating, but again for enough money they provided an interface and I think they finally figured out that the future is not siding with them as far as their being very protective of their market anymore. I think they are beginning to understand that not everyone is going to buy everything from one vendor soup to nuts anymore. I think that approach, especially for small rural hospitals, is a very difficult thing to do. They are looking to preserve their sales as best they can, so you have some leverage over them and I think the smart thing to do is make sure that whoever negotiates your contract is aware of all of these things and hold their feet to the fire and make sure that you get your deliverables before you sign off on it.

Thank you. I wanted to go back and remind folks that on the National Resource Center website, which is <http://healthit.ahrq.gov>, we do have a survey compendium and I don't know that we have a survey specific to the question that was asked previously, but we do have a lot of survey instruments there that

the National Resource Center has gathered, and there are different categories where you can narrow down the search for the kind of survey you are looking for. That is another place to look for surveys.

We have a comment that someone submitted, going back to the evaluation piece, reminding us of Julie's slide that talked about the three categories of evaluation and the importance of evaluating the implementation process itself. Things like: did the users feel adequately included or consulted regarding the vendor selection? Did you pick the right system configuration? Assessing workflow changes and what that meant. In hindsight, was the roll-out well planned? How much patient volume was lost during roll-out, etc. I think that this is another area that helps you show your success to those who have paid for the system and to your big decision-makers. I don't know if any other panelists had any comments about the importance of evaluating the implementation process as well as the actual outcomes of implementing the IT.

That was one of the major points we wanted to make is that the implementation process is iterative and it needs to be evaluated to assure that you are going down the right direction and that you are not missing something that could stop the process altogether. That was the concept of formative evaluation – formative being the fact that it is helping you with the implementation and all of those items that were listed are absolutely critical and these are questions that will be asked.

That was the point that I have been trying to make – I hope I did.

No, I think you both did make that point and that is what prompted the comment to bring that up again.

I don't see any additional questions. Well, we would like to thank you for attending. If you go to <http://healthit.ahrq.gov> you can find a number of resources, including the two evaluation toolkits that Cait discussed as well as the compendium that was brought up, a knowledge library with information on a whole host of topics, and so on. Again, thank you very much for your time today and your participation in today's call, and I would like to thank the panelists very much for your time and the excellent information you gave and the great fielding of questions. Thank you very much everybody.