



**HIT Policy Committee  
Implementation, Usability & Safety Workgroup  
Final Transcript  
March 19, 2015**

**Presentation**

**Operator**

All lines are bridged.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thank you, good morning everyone this is Michelle Consolazio with the Office of the National Coordinator. This is a meeting of the Health IT Policy Committee's Health IT Implementation, Usability and Safety Workgroup. This is a public call and there will be time for public comment at the end of the call. As a reminder, please state your name before speaking as this meeting is being transcribed and recorded. I'll now take roll. David Bates?

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, David. Larry Wolf?

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Larry. Alisa Ray? Bennett Lauber?

**Bennett Lauber, MA – Chief Experience Officer – The Usability People, LLC**

Hello.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hello. Bernadette Capili? Betty Mims Johnson? Edwin Lomotan?

**Edwin A. Lomotan , MD, FAAP – Pediatrician & Informatician – Health Resource Services Administration**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

I said his name wrong, sorry.

**Edwin A. Lomotan , MD, FAAP – Pediatrician & Informatician – Health Resource Services Administration**

That's okay.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

George Hernandez? Janey Barnes?

**Janey Barnes, PhD – Principal & Human Factors Specialist – User-View, Inc.**

Hi, this is Janey Barnes.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Janey. Jeanie Scott?

**Jeanie Scott, MT, ASCP – Director, Informatics Patient Safety, VHA Office of Informatics and Analytics/Health Informatics - U.S. Department of Veterans Affairs**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Jeanie. Joan Ash?

**Joan Ash, PhD, MLS, MS, MBA, FACMI – Professor & Vice Chair, Department of Medical Informatics & Clinical Epidemiology – School of Medicine – Oregon Health & Science University**

I'm here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Joan. John Berneike? Lana Lowry?

**Lana Lowry, PhD – Project Lead Usability and Human Factors for Health Information Technology – National Institute of Standards & Technology**

She's here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Lana. Megan Sawchuk?

**Megan E. Sawchuk, MT (ASCP) – Lead Health Scientist, Center for Surveillance Epidemiology & Laboratory Services – Centers for Disease Control and Prevention**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Megan. Mikey McGlynn? Michelle Dougherty?

**Michelle L. Dougherty, MA, RHIA, CHP – Director of Research & Development – AHIMA Foundation**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Michelle. Mike Lardieri?

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Mike.

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Hi.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Paul Egerman?

**Paul Egerman – Businessman/Software Entrepreneur**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Paul. Robert Jarrin?

**Robert Jarrin, JD – Senior Director, Government Affairs – Qualcomm Incorporated**

Good morning, here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Good morning. Steven Stack? Tejal Gandhi?

**Tejal K. Gandhi, MD, MPH, CPPS – President – National Patient Safety Foundation**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Good morning. Terry Fairbanks? And from ONC do we have Ellen Makar?

**Ellen V. Makar, MSN, RN-BC, CPHIMS, CCM, CENP – Senior Policy Advisor, Office of Clinical Quality & Safety – Office of the National Coordinator for Health Information Technology**

I'm here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Ellen. Is there anyone else from ONC on the line? Okay, with that I will turn it over to you Larry, I believe, or David.

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

All right.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Oh, sorry, it helps if I turn mute off.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thanks, Larry.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

So, I would like to welcome everybody today, thank you, thank you for the feedback on mute. So, let's go to slide two I guess, the time table slide, one more.

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

I think its slide three, yeah.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Thank you. So, this is where we are, we're going to continue our discussion today on quality systems, we're going to hear about some more work out in the world of what people are doing in terms of managing the quality of the software they produce and we're expecting imminently that the NRPM on certification will come out and that I've been warned we will have a lot to do once that happens but until it happens we're in a place of not knowing.

So, we've got some time blocked on our calendar for the upcoming couple of months so we can get back to the Policy Committee in May and, you know, I know that we're all slaves to our calendars and if it is not scheduled it doesn't exist so I thought I'd give you the head's up anyway that in addition to these meetings there is probably going to be at least individual work if not some subgroups that we're going to need to form to actually respond to the NPRM. So, just a head's up to folks that there is some work coming down the pike at us. But today we get to be students and be curious, and explore more of the world of quality systems. Next slide.

We're going to be hearing from McKesson and folks at CMMI to talk about the work that they've been doing, let's continue, next slide. And a reminder of what the quality management criteria is in the current certification criteria, basically asking people to tell us what they're doing and that this information is available on the CHPL. Next slide. So now let's turn it over to our invited guests.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Thanks, David, I thank the committee for the opportunity to present the efforts that McKesson has been investing in quality systems and what I also wanted to do was to introduce and we have Kirk Botula the CEO of CMMI Institute who is going to participate as well.

One of the things I found interesting over the past several years as we've had discussions around the applicability of quality systems in the Health IT space is that we've done a lot of work with CMMI and there were many people who weren't cognizant of who they were or what the value was and sort of their background they have been working in the software area since the 90's and it's actually a federally funded program that started off with the Department of Defense. So, you'll get an opportunity to go in a little more detail around that.

But first what I wanted to do, go to the next slide, from an agenda perspective what I'm going to do is give a quick overview of our business, this is pertinent from the perspective of the discussions that have been had around the oversight of Health IT but there is a wide range of Health IT out there and we cover that entire range and I'm going to briefly go through that to set the stage for what we do with our quality systems. I'll go into some information around that and then Kirk will provide more information around the CMMI framework. Next slide, please.

So, McKesson Technology Solutions is part of McKesson, we have a full range of Health IT related products and services. Our four primary solution lines, one is on a payer solution side, which is focused on reimbursement and revenue cycles needs and our analytics and connectivity business we focus on analytics connectivity and services that hospitals need especially making that transition to value-based delivery.

Our physician services business provides tools, services and analytics to physicians and we have a core competency in actually managing physician practices in this area of increasing complexity where it's being outsourced.

And finally, our health systems solutions that is where we offer our solutions in hospital imaging, electronic health records and revenue cycle and software solutions. Next slide, please.

So, what is key is that we cover this full range and there has been a lot of discussion around a risk-based approach to oversight and we've embedded that within our organization as to how we actually manage our quality systems.

For example, we have 14 products that are actually regulated as medical devices in the US, Canada and the EU so for those products we've established quality systems that meet all the FDA and ISO medical device requirements including products that are certified or businesses that are certified to ISO 13485 quality systems regulations and the ISO 14971 risk management standards.

For our clinical software, you know, and this EHRs and looking at the requirements for Meaningful Use we developed and deployed an MTS quality system that's based on ISO 9001 and for administrative software we have some products that are certified for example to URAC, we also use IEEE standards and I'll talk about that in a moment.

But across all these products we use the CMMI development and services appraisals to measure process maturity. For those of you who haven't worked with them before CMMI stands for Capability Maturity Model Integration it's a globally accepted process management framework and appraisal methodology and it is based on quality concepts that were originally developed by folks in the quality space Crosby, Deming, Juran, Humphrey some of those names may ring a bell.

We also certify our support organizations to a service capability and performance standards, this is an organization and a standard that is used by leading technology companies in approximately 20 countries worldwide.

And lastly, where we control this is that we have what we call our GA process which is a staged gate process, it's a fairly rigorous process by which all our products have to go through prior to a release to our customers and that's where we assess whether they've actually met the requirements of their quality system depending on the types of products that they are. Next slide, please.

This is taken out of our NPS quality manual. This is your standard ISO 9001 quality system overview. What we attempt to do, as everyone that works in that space, is to establish a continuous improvement cycle and key aspects of it are is that we are constantly going out obtaining customer requirements some of those customer requirements are in the form of Meaningful Use requirements that come our way. That's baked into our product realization that comes in as user requirements.

We then design, develop according to that test against those. Develop that product, you know, develop our products, it goes through our GA process, it goes out into the field, we then get customer feedback and we have measurement analysis and improvement programs that are analyzing the information that is coming back from the field that comes back into the cycle.

There are areas of management responsibility that are specifically called out as well as resource management. Think about this as the old paradigm of you have people, process and technology, and it's just as...we focus on process as well as the people in order to ensure that our products are going through and coming out safe and effective. Next slide, please.

One of the things, you know, we've had...there has been discussion over, you know, whether we have needs for additional standards specific to Health IT in the quality system area. One of the things that not a lot of folks, you know, focus in on is the Institute of Electrical and Electronic Engineers, IEEE, they've generated over 30 domain specific standards in the software engineering field that maps right to the ISO 9001 framework. This is a fairly rich set of standards and one of the things we've been doing is going through those standards and looking, you know, where we can pull out best practices to continuously improve the processes that we've established as part of our quality system. It's one of those things where this is always ongoing you never have a perfect quality system you always have opportunities to improve and standards like the IEEE standards are really good.

We right now for example, there is a standard out there IEEE has for how you categorize defects and we're looking at that and looking to see if there are some, you know, elements that we've identified through that which would actually enhance what we do internally so we're working with our businesses then to embed that into our systems that track, you know, for example our calls and our defects. Next slide, please.

What we tended to do here was try to illustrate a principle as how CMMI works with our quality systems. The key take away from this is CMMI is not a standard. CMMI is an assessment methodology, it's a framework for processes and what you do...the way it works is we do independent assessments of our processes and they rate on a scale of either level 2, 3, 4 or 5 according to CMMI methodology.

Even if we have a process that is defined to be level 5 which means that basically you have a very well-tuned process we've got great feedback loops, everything is documented, the process is highly formalized that alone wouldn't get you, for example if we have an FDA regulated product, that wouldn't be sufficient because there are things in the FDA part 820 that go above and beyond what are just necessary for a good process, what would be embedded, you know, from a CMMI perspective for software best practices that we have to make sure that we have in place.

So, for us we don't rely on CMMI, so CMMI is not our quality system it's a way that we look at assessing the maturity and we have to make sure that we have quality systems that meet the requirements necessary especially in the FDA space where we're looking at either the FDA Part 820 or the ISO standards that are associated with it. Next slide, please.

Now the way we've implemented the CMMI program, so one of the elements of the CMMI program is that it's an independent assessment. So, we have a corporate CTO office or Chief Technology Office what they've done is establish programs where the CMMI appraisal resides.

We also have a group within that organization that goes out and does independent assessments, independent audits of our FDA products and they also do the work for our services organization through the SCP certification and they do this not only for our technology solutions business, MTS, but they also do it for our distribution side of the business where we also have software applications and other services.

We created this because what we wanted to do was have an independent organization that could really focus in on having an independent assessment of where we stand and working with our businesses to identify opportunities for improvement and it's worked out very well and for example, my role is I actually am the head of quality for the MTS business unit, so that group doesn't report to me they're independent, they provide feedback we use that feedback then to improve our quality systems.

We selected CMMI because it services and it has flavors for both services and software development, it's an extremely mature appraisal methodology, it has rigorous credentialed appraisers and it's governed by an external organization. It's also, you know, recognized worldwide as a quality indicator and the formal auditing of appraisal activities result in publication of appraisal results.

So, if you want to find out whether someone, you know, what level someone is from a CMMI perspective you can go to the CMMI Institute site and there is a list there and it will show you at what level the different organizations have been appraised to. Next slide, please.

So, what we wanted to do is to also talk about some of the benefits that we've seen and these are examples that are taken from multiple products that we've done CMMI appraisal work in. We had one product line where we had a 40% reduction in defects that is not uncommon. If you look at a lot of the early studies around CMMI what you saw as benefits were, you know, decreased defects, you had, you know, better time to market, you had better scheduled maintenance.

The last one of these...so, you know, we had all time completion rates that have been increased, we've had reduction in support fulltime equivalents needed because we've been driving down defects. We've met, you know, our milestones and the last one is an interesting one this is one of our businesses and in particular that has an ISO certified quality system in place. CMMI took us...once we put the CMMI program in there and they've been very rigorous adopters of the CMMI program their class rankings went from a 6 to a 1 and they remained in the top 3 since their CMMI achievements. And that was...they were at a 6 even with a certified quality system in place. So, CMMI has had a definite benefit in improving the overall rigor of the quality system that was established.

And just a note there, you know, they're certified, you know, they have outside, you know, notified bodies that come in and certify them to the ISO standards so they were meeting everything that was necessary by the standards. CMMI just gave them a much more rigorous way of managing those processes. Next slide, please.

So I think in summary, one of the reasons that we wanted to talk about CMMI is that we see that as highly complementary to our quality systems, it's an existing and it's a proven industry standard, it assesses capability for systems deployment and services deployment and I know in the discussions that have been ongoing in the industry we've identified there are a lot of standards for development but one of the gap areas has been in the services component and that's where we've helped, CMMI has helped us fill that gap since there are not many standards in the services aspect, think about implementation, you know that area, that's where we actually use that to assess our services organizations that go out and do those field implementations.

It's a formal methodology for benchmarking purposes, its flexible, it can be used...so it's not used just in software alone it's used by a wide range of businesses across a number of different process areas and what's good for us is it defines and arch of an evolutionary path from more...so your initial appraisals you may have some areas where you still have some ad hoc process activities going on and what you want to do is you want to be able to drive through these stages to where you have disciplined mature processes. Next slide.

So, at this point I would like to turn this over to Kirk Botula who is the CEO of CMMI Institute. Kirk are you on the line?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yes, I'm here, Mike.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Okay, I'll let you take it from here.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Great thanks very much. Mike thanks very much for the earlier introduction and for providing the background on the impact that CMMI has had at McKesson. And thanks very much for the invitation to speak to the group today.

CMMI Institute is focused on helping organizations develop capability maturity and if we go to the next slide McKinsey defines capability as anything an organization does well that drives meaningful business results. So, it's a pretty big mission.

But to take it a little bit into a more specific context, if we go to the next slide, please, the CMMI Institute was instantiated at Carnegie Mellon University after 30 years of ongoing research at the Software Engineering Institute which is a federally funded research and development center, it's the only one in the country focused specifically on software and it's like other FFRDCs like Lincoln Labs, JPL organizations like that, the SEI's mission is to advance software and the CMMI was its first project it was the Office of the Secretary of Defense, OSD, had chartered them to essentially solve the software problem and what they meant by that was we're dealing with mission critical environments that are highly dependent on software in embedded systems, lives are on the line, we can't have people needing to, you know, reboot their applications when there is an ordinance flying through the air at 15,000 feet looking for an address.

So that's really been the initial focus of the Software Engineering Institute and was the initial mission of the CMMI. It was developed through the collaboration of industry, trade associations, members of government and academic researchers. If we go to the next slide, please.

The result has been the framework that Mike was talking to you about and it really develops improved performance and resilience in areas of project and work management, people management, service delivery, process management, the supporting infrastructure that's necessary to achieve throughput, product engineering and development, supplier management is also of course important in any complex supply chain and data management.

Going to the next slide, the key value proposition which we all understand in developing capability maturity is reduction in things like defects, cost, time rework, risk and improvements in areas of quality, speed-to-market, customer satisfaction and organizational performance against business goals. Next slide, please.

Some of the kinds of results, I'd say the experience of McKesson isn't uncommon in collaboration with a lot of the quality standards when harnessed by a framework like CMMI which provides a roadmap to a culture of continuous improvement and with independent appraisal you see the sorts of things like at Tufts improving their defects by 25% or if you look at the next slide, if we can go...yeah, General Dynamics was able to actually reduce their maintenance staff cost by 64% while doubling the size of the organization so significant improvements, decreasing cost and enhancing productivity. The next slide, please.

Siemens, we were talking about the importance of customer satisfaction they were...in three technical areas they improved their customer satisfaction index an average of 42%. The next slide, please.

And improved on time delivery and this is something we consistently see things like the experience of JPMorgan & Chase seeing project delivery date slippage reduced by 70-80%. And the next slide, please.

To give a little bit of a perspective on the history of CMMI, as we said it originally began with the question with the advanced defense research saying, how do we make software reliable, which led to, how do we make organizations who can consistently operate collaboratively at a high-level performance, that led to the CMMI and after initial adoption within aerospace and defense because of its effectiveness in helping organizations align their operations to their mission particularly in areas that are mission critical such as defense, such as medical, such as automotive, such as financial services or in service organizations for example in the software outsourcing industries and in Asia you saw significant adoption.

So the CMMI has...there have been formal appraisals done in over 10,000 organizations, it's been adopted in over 100 countries and actually in the summer of 2012 we finally went from 6 continents to 7 continents, there was an appraisal done at the McMurdo Research Station in Antarctica by Lockheed. So, it's gotten pretty widespread geographic adoption.

Twelve governments around the world have formally supported the adoption of the CMMI to elevate capability maturity within particular industry segments. It has been translated into 10 languages. And there are 500 organizations around the world where there are individuals who are certified to appraise organizations and help them identify gaps and action plans to be able to increase their capability maturity and their performance and then the number of appraisals globally has increased each year. In 2014 there were over 1600 formal appraisals completed. If you could go to the next slide, please.

Here is just a picture of some of the organizations who are currently using it and you can see the application ranges from, as I said some of the mission critical environments like NASA to organizations that are building medical devices or products with embedded systems like Siemens to organizations that are dealing with consumer electronics like Samsung.

And if we go to the next slide...these organizations that have some aspect of their business that is related to healthcare in some capacity. And as Mike was saying, the increasingly...what began with an initial focus on software developed into...extended into understanding services and understanding the complete supply chain, and understanding it's relation to data, because ultimately every organization today rests on a foundation of this market to organization feedback loop that's enabled by an infrastructure of information and highly dependent on consistency of results, reliability of information and effectiveness of execution in order to be able to meet regulatory requirements, meet safety requirements and satisfy customers. And that's ultimately how the CMMI has evolved.

As I had mentioned the CMMI Institute itself was stood up independently of the Software Engineering Institute just a couple of years ago because of the success of the CMMI outside its initial core mission. It had begun as an R&D initiative of the Department of Defense, as you can see now, if I were in charge of the Defense Department budget I would look at this and say, hey, wait a minute guys, this is extended well beyond the scope, it has been successful well beyond what its initial charter, it's time to put it in an independent organization that could continue on that mission.

So, that's really what we've been focused on and I'd say we have a long history of collaborating with government and with industry trade associations to tailor solutions to make sure that CMMI is evolving appropriately and fit the purpose for their needs.

And so if you have any questions about any of that I'd be happy to answer them and I'm sure Mike would as well. And I would say there is one more slide there also with some follow-up information I think.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

I'd like to thank our presenters. Are there any questions or comments from the Workgroup members?

**Paul Egerman – Businessman/Software Entrepreneur**

Yes, this is Paul Egerman I have a couple of questions.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Go ahead, Paul.

**Paul Egerman – Businessman/Software Entrepreneur**

So, first, thank you very much Mike and Kirk this is a very interesting presentation and you put a lot of effort into it, so I appreciate it. Your slide number, on my deck it is number 14 Kirk, I have a couple of questions about it. You say there was a reduction in defects greater than 40%. So, my questions are over what time period was that number one and number two, is how do you define a defect?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

That's a great question and I'd say in that particular case I don't have the details on that case study on hand but I would say if you're interested in that we have over 30 years of research, case studies, use cases and things like that and academic research that gets into the specific results which I'd be more than happy to provide as a follow-up.

And I'd say, you know, there is a wide variety of case studies you may find some that are more specifically applicable to an area that you're interested in, but I'd say, I don't know the specific details on that.

**Paul Egerman – Businessman/Software Entrepreneur**

And do you know the definition of a defect though?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

In that...

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

So...

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Mike go ahead.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

So, for McKesson...so, McKesson would be...so we have a customer call in who identifies an issue with our product and what we've then done is evaluate it and determine that there is a defect in the application, you know, which will require...and that defect could be a range of, you know, either we didn't get the, you know...we didn't get the initial requirement absolutely correct or there was an actual coding error associated with it.

Sometimes a defect may be associated with a...for some of our products with how it has been configured and that may be ours or it may be us, or it may be the customer who is doing that. So, they could be in that range of defects.

**Paul Egerman – Businessman/Software Entrepreneur**

So, the reason I'm asking that question is the impression I got from listening to this presentation, which is an impression I've got from a lot of quality systems, is for software it seems like the number one issues is reliability and some people conflate quality with like satisfaction or usability.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**  
Right.

**Paul Egerman – Businessman/Software Entrepreneur**

But this is really focused on reliability or very specifically does the application do what the manual says it is supposed to do?

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**  
That's correct.

**Paul Egerman – Businessman/Software Entrepreneur**

So, an implementation of this, of your quality system does not necessarily mean that you have the most usable system in the world or that you are...that the users will like this system better than a system that did not use this quality system it just means that it's going to hopefully have a greater degree of reliability it's not going to crash, it's not going to do something bizarre...

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**  
No so...

**Paul Egerman – Businessman/Software Entrepreneur**

When you say what is 1 + 1 it will always give you 2 it will not ever give you 2.1.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Well, I would say it would...I'd say it includes reliability or performance to specification in a sense but it also includes requirements management which gets into the questions of fit to purpose and customer satisfaction.

I mean, ultimately, many, many organizations define quality as a mix of competitive fit to purpose, you know, kind of the customer satisfaction relative to a competitive set, performance again against expected reliability and consistency on sort of...on a price performance index, right, so there is sort of a holistic view of quality that I would say the CMMI essentially ties your organizational processes and infrastructure to your business goals.

So, I'd say it's not prescriptive and it's true it's possible if someone has the wrong business goals the CMMI will help them achieve those incorrect business goals, but it actually requires an intentional process of aligning your business objectives to the operational infrastructure.

**Paul Egerman – Businessman/Software Entrepreneur**

And that makes sense. In our last call we had a presentation that I considered almost a classic where there was another vendor presented their quality program, when they're all done a physician who uses that vendor said, well how come I don't like what's going on if you have such a great quality program and the response was, well, you know, you're one user we don't know how the system is configured, a customer is your institution and, you know, the system works the way it's supposed to work. And so fundamentally it's an interesting challenge. What you're doing is very important work and I like this presentation a lot but a lot of the people I think don't quite understand that it does not necessarily mean that a physician using the system isn't going to be frustrated when it takes a long time to enter data for example.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Right and I think that's a very good point and I think that's where, you know, usability comes into play. So, I mean total...getting to that level of customer satisfaction means that, yeah, you have standards around the quality systems but what you also need in the software space is to have expertise and usability and to ensure that this is being applied to the product as well. It's multifaceted.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah and I think one of the things that's evolved over the past 10 years in particular is trying to shorten the cycle time between the user/end-user's experience and being able to pivot solutions rapidly in ways that created value or are meaningful to the end user, right, so a lot of engineering environments are focusing on more aggressive approaches to iterative development, more aggressive ways of dealing with rapid prototyping and feedback.

A lot of the software services cloud-based consumer solutions are running products almost in AB testing environments where...like we all know the consumer experience of something like a Facebook which is explicitly not mission critical, however, you know, product managers there will test a new feature and they can pilot it with 2000 users to see how it works, they can watch the behavior of the user and then through the design of experiments actually iterate their way to a better user experience.

Now what's happening a lot in the DoD space and other mission critical space is folks are looking at...where risks are much higher, how can we do some of that through prototyping and testing up front to improve the end user experience and so I think that the...I think the state of the practice in getting solutions that make doctors happier faster is improving, you know, you see...in the industry I think you see cross functional teams, you see the kind of anthropological research done on the front end of products and that sort of thing.

And I'd say what the...so as the state of the practice evolves the CMMI continues to aggregate and promulgate, you know, what we're learning as a community that at its heart it's about creating resilience and consistency within the organizations so that a good solution isn't a lucky one-off time, you know, that we can...that the organization can take those learnings continuously and deliver the results again and again, and again at a high performance level.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

I think that...

**Paul Egerman – Businessman/Software Entrepreneur**

You're exactly right, I appreciate that comment, that's very helpful.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

And in the software space, I mean, a lot of what you see going on, especially in the development environments is a migration away from waterfall development methods where you have requirements that is defined months in advance and, you know, a customer doesn't get to see it until like, you know, 6-8 months later to where we're going into much more lean...agile types of environments where we can iterate and get something out into the customer's test site much more rapidly and so that we are waiting until the very end to deliver something so they can actually start some iterative evaluations of the application is a major improvement and interesting because there is always been a push/pull between the move towards lean/agile methodologies and CMMI which is sometimes mischaracterized as being heavily, you know, more burdensome because it was focused on these large systems. We find that we can still use the CMMI principles even within that migration over those agile methodologies.

**Paul Eggerman – Businessman/Software Entrepreneur**

Great.

**Joan Ash, PhD, MLS, MS, MBA, FACMI – Professor & Vice Chair, Department of Medical Informatics & Clinical Epidemiology – School of Medicine – Oregon Health & Science University**

So, this...

**Paul Eggerman – Businessman/Software Entrepreneur**

I have a couple of more questions but I will give other people a chance. Sorry, go ahead.

**Joan Ash, PhD, MLS, MS, MBA, FACMI – Professor & Vice Chair, Department of Medical Informatics & Clinical Epidemiology – School of Medicine – Oregon Health & Science University**

Yeah, this is Joan and I had a related question, Mike mentioned that through this methodology you can assess field implementations, could you tell us a little bit more about that aspect of it?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Mike, do you want me to speak to that?

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Yeah, that is in reference to the services aspect, I'll let you as you have expertise.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah, sure, yeah, so the CMMI has...looks at capabilities through a couple of lenses, we call them the CMMI for development, CMMI for services, CMMI for acquisition which is really supplier management, the people CMM which is focused on human capital and the data management maturity model which is focused on enterprise data.

The services model really looks at any service organization and in fact it is used in some businesses that have absolutely nothing to do with technology or IT and it helps to...it deals with issues around service delivery, around capacity and available management, around responsiveness to, you know, the sorts of things that we're talking about when you have product solutions deployed in a hospital or something like this, you know, it's the lifecycle of the product in the deployed environment and how effectively, and how resilient, how effective, how responsive is the delivery of meaningful results to the customers and users in that environment.

And you can see the service organizations understand this need...the need for high performance service and increasingly for software and engineering companies those things are completely blending, I mean, if you look at something...a company in the consumer products world like Amazon, are they a software company, are they a service company at a certain point the distinction becomes meaningless, right, and so if we're going to look at the performance and the quality of a holistic system that's ultimately focused on an end user, a customer, an organization or some set of stakeholders you have to incorporate the service dimension not just a core product or a core component you have to look at its performance holistically within that system.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

So, for us at McKesson, what we do is we...our assessors, we do assessments using the CMMI for development in our development organizations and then we also do assessments for the CMMI for services...with our services organizations, which are the ones that go out and do the implementations and they share a great number of core process areas but what differentiates them is process areas specific to each of those environments. And so we have assessors that are looking at both parts of the organizations.

**Joan Ash, PhD, MLS, MS, MBA, FACMI – Professor & Vice Chair, Department of Medical Informatics & Clinical Epidemiology – School of Medicine – Oregon Health & Science University**

Thank you.

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Yeah, this is Mike Lardieri, I have a question, thank you for the presentation, very helpful. I assume there is a cost to getting a CMMI assessment done in your organization. So, my question is about are there any barriers for smaller organizations coming in?

I mean, just looking at what was up on the screen many of the organizations are very large organizations and they could afford to pay for the assessment. Some idea of what's the smallest organization you have that uses CMMI and I guess I'm really trying to find out are there barriers to smaller organizations using it?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah, that's a great question and the...about half the appraisals done last were on organizations of smaller than 50 people. So, it's true that the CMMI benefits, you know, the GMs and the Siemens of the world, and lots of suppliers in the value chain use it, and I can tell you from personal experience in my past life I ran a small financial technology company that did a performance measurement for the asset management industry. So, it was not...lives were not at risk as in your industry, but getting the numbers right matters to lots of people, so when it comes to their money.

And so we took a lot of the approaches of mission critical and safety critical organizations and we found the CMMI incredibly powerful but the thing is, and I'll say this, we never got an appraisal, we never had a formal independent appraisal simply because we were using it to elevate our performance and in our market it was not particularly valuable our buyers weren't using it to determine whether or not our solutions were reliable.

Now meanwhile the opposite extreme would be if you look at the technology outsourcing industry in India the CMMI is almost like a passport and that grew organically because I don't know if you can recall there was, you know, years ago when people would say, well you can't get reliable work done from India as a response to market perception a number of companies within India began to work very aggressively to genuinely create high performance software engineering environments. So, there is a pocket of organizations there that are very, very...they're all service organizations and they're focused on high maturity, software engineering and for them the formal appraisal is the cost of doing business.

Then I would say similarly, there are certain industries where you'll see CMMI levels requested in RFPs and its seen as a...you'll see this commonly in defense and aerospace, you'll see it sometimes in automotive, you'll see...this is where you'll see...often times in government contracting folks will say, you know, to bid on this you should have a CMMI maturity level 3 or something like that. So, I think that's all context to speak to the independent appraisals themselves function differently in different markets.

The cost of an appraisal, there are three types of appraisals that increase in level of rigor and the most rigorous, which is the numbers that we provided that there were 1600 of them last year and there are the ones that we've published the formal results, they probably range in price from 10,000 to 100,000 dollars based on the size and scope, and complexity organizations. So, it is possible for little organizations to get value out of it and even to get an appraisal.

So, I'd say it isn't cost prohibitive. In my own personal experience we actually got a lot of value out of the CMMI and didn't, while I was there, pursue the appraisal. At a certain point we thought if we got to the point where we were high maturity which is what they would say a level 4 or 5 I would have gotten the appraisal just to show off relative to all my competitors, but we didn't get there at that point.

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Great.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

I don't know if that answers your question?

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Yeah, yeah it does, very helpful, thank you.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Well, and Kirk, I think the materials, the model itself is out there, right, anyone can go access the...

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yes.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Materials and use it internally if they don't want to do appraisals and it cost them nothing to do that.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah and that's a good point. The model itself you can download for free on the Internet or I think for about 30 bucks you can get the book from Pearson or one of the books there is a whole host of books. So, yeah, it's not really treated as a secret sauce, it's, you know, treated as a body of knowledge that we're seeking to, you know, promulgate and help organizations adopt.

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Very good, thanks a lot.

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

This is Dave Bates, could you say just a bit more about the levels and sort of how they map to the current software in HIT?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Sure, maybe I'll give a general overview and then Mike if you want to comment. The five levels you can think of as one is no one really gets appraised at a one, one is just a chaotic ad hoc environment.

Level 2 I would...we call it as managed, the managed level and my layman's view of it is really there you generally see basic good hygiene around managing individual projects. Level 3 or I should say we call that defined, level 3 we call managed or I'm mixing them up, 2 is, yeah that's right, 3 is defined and there the shift is really organizational at level 3 you see a consistent approach to dealing with projects.

So, for example at that level an organization might have...they might have three or four categories of projects, they might say something like, these are safety critical, these are internal IT, these are custom...they'll have a handful of different approaches to development that are usually risk-based and their processes will be tailored appropriate to the objectives of the work that's being done, and there is what I would say, kind of an enterprise view of process rather than just a project level view.

And then at levels 4 and 5 you're looking at quantitative approaches and optimizing kind of ultimately achieving level 5 is a cultural of continuous improvement that's using data from the actual behaviors empirically in the operating environment to forecast and plan to predict...to be driving decisions to be able to predict performance of the business as a system.

So, 5 you've got a live feedback loop with meaningful data that's allowing you to manage risk and plan the future and improve your processes through that feedback loop and it sort of goes from one, we don't really have our act together up to the point where you have that working holistically. So, that's my layman's version. Mike, I don't know if you want to add some color to that or offer a different perspective?

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Sure. So, I think the question of sort of where McKesson is at is that we've had a program that's been ongoing for several years now, a formal program, where we have...so one of the things...so we established an organization at the corporate level. So, we actually have individuals who are certified appraisers that have gone through all the training and that includes, you know, CMMI coming out and actually going through an appraisal with them as observers to ensure that they know what they're doing basically.

So, we have business unit levels now that have been appraised anywhere from, you know, 2, 3, 5. We've had some...we've had one business unit that achieved 5. Our objective is to work through...what we'd like to do...our first step was get everybody to level 2 and for...and looking at some of the independent assessments that's where the biggest increase comes is making sure that you're at a level 2 then, you know, our goal is now to start moving everybody to level 3 and that's where we see the major payoff is at those levels.

If an organization wants to get to 4 or 5 that's great but we see the biggest benefits from our perspective in terms of quality and cost drivers is getting, you know, we'd like to get everybody to a level 3.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah and Mike I think that's actually a good point because when people see a 5 point scale they assume that 5 is the best and I'd say most of the world probably gets most of the value at level 2 and 3, and it's really particular types of organizations in particular contexts that really, really, really benefit from the high maturity practices, you know, and so I think that's very typical if you look at, you know, folks in defense aerospace will have units operating at different levels of maturity really as a result because their business objective is a mission.

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

That was very helpful, thank you.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Hi, it's Larry, I've got a couple of questions. This first one I think actually sounds like from the prior answer may actually have a pretty complex answer. Could you talk at all to timeframes. So, an organization decides we want to go down this journey what kinds of timelines do they typically look at?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

That's a great question. Generally, if I recall from the data off the top of my head, it's usually 18 months to 24 months between levels is conventional and I'd say that's the...again when you're dealing with larger organizations there are the outliers, which I don't think is really relevant to this conversation but just as a frame of reference, there are companies that will start a software factory from a greenfield and they'll put in high maturity practices from day one.

Now they won't really be a high maturity organization because, you know, people are still learning their job and how to do things, but you could imagine just as in a physical factory someone starts a very sophisticated factory on day one they, you know, have to shake it down and people need to learn to use their jobs but they will achieve a level of maturity faster than if you have to go through a process of organizational change and evolve something organically. So, I'd say for that latter case, which is much more common, it's generally 18 months to 24 months to move between levels.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

So, I'm hearing that in terms of establishing a program, so assuming an organization is doing whatever they're doing and at the least it is not rated against CMMI might be ad hoc, might be pockets of various levels of maturity to sort of bring in the basic organizational approach, get people informed, do the pilots that big organizations typically do or the change management that they need we're probably looking at a year and a half to two years, the 18-24 months kind of timeframe, to get going. Is that reasonable?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

That's a good question and I think I would say it is the adoption of a program, there is change management involved, there is, you know, training involved so I would say it's probably consistent with whatever those kinds of initiatives work with, you know, have been in a particular organization, you know, every organization has a certain capacity to absorb change and as I said I was running a small organization and it was small I think, you know, we had like 50 engineers there, it took to come in do the training, do initial comprehensive assessment, do gap analyses these sorts of things and get to a point of pilot the first stage took us about 6 months, the initial pilot took about 3 months and then we began cascading the approach across the different product lines and so I'd say that's for a small organization and I think your intuition is probably correct, you know, I'd just say, you know, it is a change management initiative and it's deployment depends upon the capacity of the organization to manage and deploy something like that.

And as I've said, we've got 400 certified folks around the world who help organizations do that for a living and it's a...but I'd say what you're suggesting makes sense and I think it's ultimately driven by executive priority and commitment, you know, there are executives that can say, we're going to get...frequently will say, this year we're going to get this deployed, you know, by the end of Q4 we'll have our pilot or whatever, you know, but that just depends on executive priority.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Sure.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

And so this is Mike, I mean from McKesson's stand-point we have 6 certified appraisers, we typically from the initial engagement to the certification level is about 18 months and that's consistent with what Kirk says from an industry perspective that's been ours.

And on the earlier question we had one example where we had a 40% reduction in defects that was over an 18 month cycle from when we initially started to work with the organization to where they achieved their initial level.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

So, this is Larry, I've got one other question. So, this is sort of related to something that Joan was talking about. So, in healthcare we've been hearing a lot from the vendors and also from the healthcare providers that we really are in a dual phase of development if you will, vendors build products and then those products historically have gone through varying amounts of modification, configuration, adjustment, workflow changes, etcetera, as they get implemented inside a provider organization.

So, any thoughts about this dual environment that we're in and how this kind of maturity model might apply to that?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

So, I think there are two separate questions, I think that the...I think everybody in every industry is very focused now on what...how can we shorten the cycle...how can we shorten the feedback loop, right, and the...and I used the illustration earlier of when we look at companies like Facebook, you know, these zero risk software company as services whose revenue model doesn't even depend on customer satisfaction, who are able to deploy new versions, screw it up, do it again an hour later without anyone blinking an eye, right?

And I'd say looking at some of the improvement on cycle time that people are able to achieve in that kind of operating environment and say, hey, what can we learn when we're developing hardware with embedded systems that are safety critical, are there things we can do either through design or architecture through process to facilitate learning, you know, more rapid learning cycles or, you know, people like to call it agility, right, but really what it is, is the ability to respond to new information rapidly, right?

And I think that for...I'd say what I've seen a lot of, hardware manufacturers in high risk organizations do is try to do more iterative research on the front end to do...because it's a lot harder to change manufactured products when they're in the field.

We're learning now how to upgrade, you know, update RAMs and things like that, you know, our televisions can update their software on line now but when you have the integration of the hardware and the software you run into constraints.

And so we've seen...there are little organizations springing up all over focused on, you know, human computer interaction, anthropological research to try to shake down user experience issues and things like that up front as opposed to in the field and using new techniques to do that and then using architecture ways of updating code things like that so even once it is in the field it's less costly to...we can think of the experiences going back to just upgrading Windows 15 years ago would be an 18 month roll out with IT guys running all over a hospital or something, you know, now if it's been tested it can be, you know, cascaded out overnight. So, I think you see both the application technology and new methods to try to improve that sort of thing.

With regard to the CMMI I think one of its strengths is actually the fact that it isn't prescriptive. We talk about what has to be done not how to do it which is also one of the reasons why it's used so widely in such different context, you see agile organizations, waterfall organizations, organizations that are using pair programming, organizations that are pure service organizations because...and again this is where it gets a little bit confusing but it's not a quality standard it's a framework for performance management that at one level of abstraction further. So, I think consequently one of the virtues of the CMMI also is because of this breadth of footprint the state of the practice and shared practice people are able to learn what's working.

We have an organization based in Switzerland called Minicom it's 100% agile organization, high maturity CMMI organization, well through our community they are able to have conversations with folks that are manufacturing automobiles and pushing that boundary of saying, how do we get our systems and processes to perform more meaningfully on the business goals we're pursuing while maintaining resilience, while managing risk, while doing this in a way that is going to get the outcome that we're looking for.

So, I would say I'm not sure it that specifically answers your question, but I'd say there is that two phase environment and I just see a lot of organizations we work with are trying to figure out how to reduce risk and shorten cycle times and create resilience on the product platforms such that they are fit to purpose.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

And this is Mike Marchlik, I want to, you know, include a response too, and Kirk, you know, we haven't talked about this previously but I think what I'm hearing is we've been looking at this area of implementation and use, and you know, what are the standards that would be appropriate to it. I think one of the opportunities would be to have...you know, CMMI, you know, does help organizations tailor and this maybe an opportunity...I think as we have any discussions around those our perspective is it would be great to have the CMMI folks participating in that because they can adapt their models and make them more specific to a particular area which would actually streamline implementation, you know, all of the approach that then has to be more specific to this particular area.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah and I would say that's something that we have a long history of doing, we're very comfortable doing, in fact like the data management maturity model, which is generally just used for enterprise data management, we're working very closely with the financial industry to deal with specific financial regulations and apply some tailoring for that purpose.

We also had a...did an extension last year with some organizations that were really, really, really concerned about security in embedded systems products, you know, like they don't want people hacking their car, right, and so we frequently work with trade groups or specific industries to help tailor or make more explicit particular needs around industry verticals.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

So, thanks, I guess I didn't expect to hear a simple answer and I didn't...but I guess I'm concerned...so one of my takeaways is you're seeing people who are building products, engaging their customers sooner in the product creation process and developing more rapid feedback loops so that what gets delivered may require less change in the final environment because the build process got the product, you know, in a place where it needed less change once it was installed or once it was acquired.

But, I'm also hearing a likely implication of this is going to roll over into the provider environment that while a lot of providers might wish for, just give me the thing that's going to solve my problems and I'm done, healthcare is not itself that well structure that someone could say, here, we have the generic healthcare solution, you have the generic healthcare environment and you're good to go, huge amounts of variation from that statement. There is not a generic healthcare environment out there.

**Michael Marchlik, MS – Vice President Quality & Regulatory Affairs – McKesson Provider Technologies**

Yes.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Correct, yes, I think that's right.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Okay.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yeah and I also think that what you're seeing in addition to being able to improve the fit to purpose and design earlier people are trying to apply the principles of, you know, design from manufacture ability, right, the flexibility so that when something is in the field it's easier or cheaper to upgrade or modify, or respond to feedback and I think the classic example is, you know, Ikea's tables where they design them so that, you know, the holes in the table leg can be plus or minus a half inch, you know, Ethan Allen if the table leg is off ¼ of an inch they wind up with scrap, at Ikea, I think their scrap rates are astonishingly low because of their design, right, they've designed it for the variation in the manufacturing process and those same sorts of principles being applied are again helping to make the products more resilient and adaptable in the field.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

That's a good thought, thanks. Other questions from the Workgroup? Okay, maybe we should think about going to public comment? One last call for questions from the Workgroup?

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

Just to ask, what is the...while we're getting ready for public comment, this is Dave Bates, what's the current relationship with Carnegie Mellon, do you still have a relationship with them?

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Yes, Carnegie Mellon owns us.

**David W. Bates, MD, MSc, FACMI – Senior Vice President for Quality & Safety and Quality Officer – Brigham & Women's Hospital & Partners**

Gotcha.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

So, should we switch to public comment?

**Public Comment**

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Yeah, Lonnie or Caitlin can you please open the lines?

**Lonnie Moore – Meetings Coordinator – Altarum Institute**

Yes, if you are listening via your computer speakers you may dial 1-877-705-2976 and press \*1 to be placed in the comment queue. If you are on the telephone and would like to make a public comment, please press \*1 at this time.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

So, while we're giving folks a chance to dial in I want to thank the presenters today, pretty rich presentation, thank the Workgroup for your comments and questions, you know, this whole area of how do we improve the quality of the software we have is one of endless attention and we're looking for ways in which we can navigate some of the risks of grabbing things that look like they're attractive but do not have a good track record or not fully understanding appropriate complexities and jumping into something too soon.

I particularly liked the comments about that there are benefits in moving or being at level 2 or level 3 and that this should be seen as if you're not at level 5 then don't undertake the journey and as we look to possibly having this inform any recommendations we wind up making to understand the value of those initial steps, I think that was a really helpful comment from you guys. So, do we have any public comments?

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

We do not.

**Larry Wolf – Senior Consulting Architect – Kindred Healthcare**

Well, I'd like to thank everybody for their time today and we'll give you back some time in the day.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

Well, thanks for you hospitality.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thank you Larry and thank you to our presenters.

**Kirk Botula, MBA – Chief Executive Officer – Capability Maturity Model Integration Institute**

It was a pleasure to join you and let us know if we can be of any further assistance.

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Thank you.

**M**

Thank you.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thank you everyone, have a great day.

**Michael Lardieri, LCSW, MSW – Assistant Vice President Strategic Program Development – North Shore-LIJ Health System**

Bye-bye.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Bye.