

Dave Mosher, Raytheon Program Manager Integrated Battle Command System

This in-depth interview with Dave Mosher of Raytheon continues our series of monthly interviews with business executives, government officials, academics, and area program / project managers in PMI-NAC Newsletter.

Our goal remains to present the leading ideas and insights on the practice of project management for our readers.

In this interview, Dave discusses key factors required in Raytheon's program management efforts in support of its contract with the U.S. Army Integrated Battle Command System (IBCS) that it manages here in Huntsville.

Dave Mosher was interviewed for the PMI-NAC Newsletter by Don Ross, PMP

Raytheon, with 2007 sales of \$21.3 billion, is a technology leader specializing in defense, homeland security and other government markets throughout the world. With a history of innovation spanning more than 85 years, Raytheon provides state-of-the-art electronics, mission systems integration and capabilities in the areas of sensing; effects; and command, control, communications and intelligence systems, as well as a broad range of mission support services. With headquarters in Waltham, Mass., Raytheon employs 72,000 people worldwide.

Raytheon's Huntsville operations began in 1967. In 1989, a factory was built on James Record Road to house the Patriot support operations, operations analysts, and engineering. In 2004, Raytheon committed to consolidate its operations across its businesses in Huntsville. As a result, the Center Executive position was created to help synergize six Raytheon business operations and personnel. In 2007, the \$26 million state of the art Jan Davis Drive facility opened for business. The Warfighter Protection Center facility located here is a multi-business center and provides for future growth.

Raytheon has more than 600 employees in Huntsville with the majority in the Integrated Defense Systems unit. Raytheon operations here also support Intelligence & Information Systems, Network Centric Systems, Raytheon Missile Systems, Raytheon Technical Services Company, and Space and Airborne Systems.

Raytheon customers with Huntsville operations include the Army Materiel Command (AMCOM, AMRDEC, and USASAC), Missile Defense Agency, Space and Missile Defense Command, NASA Marshall Space Flight Center, PEO, Missiles and Space, PEO, Aviation, the US Army Corps of Engineers, the Federal Bureau of Investigation, and the Department of Homeland Security.

Integrated Battle Command System (IBCS) is a U.S. Army joint development program with a modular, open architecture, system of systems construct allowing air and missile defense warfighters to use any sensor and any shooter within an integrated fire control network. Raytheon won the first stage of a competitive, multi-phase army award for IBCS in late September 2008.

Visit <http://www.raytheon.com> for more Information.

PMI-NAC: *For our readers who may not be familiar with Raytheon Integrated Defense Systems activities in Huntsville – can you give us a high-level summary on what we need to know about your firm and its business activities?*

Mosher: Like many companies in town our primary customer is the warfighter. Dealing with Redstone Arsenal and the Space and Missile Defense Center (SMDC) – everything we do is designed to meet our customers' needs and our government customer needs in particular. From an IBCS standpoint - it was critical to house the Program Office and large chunks of the engineering team at the WPC here in Huntsville. In my role, I head up Phase I for that program.

For the size of Huntsville's Raytheon footprint – the number of top managers, executives, and technical talent we have working here represents a very substantial commitment to this area and the customers we serve.

What you see here in this building – shows that commitment. This structure has been here about two years now. One reason this building was built is because we are growing – and it provides a centralized location to serve our customer better.

The other piece of this is our community involvement. Locally, we are doing things such as funding robotics programs in high schools, the Heart Walk and similar community interests our people support where we live.

Raytheon is very big on being a good neighbor in communities where our employees live and work. Over the years we increased support to the community, and not just financially but with volunteer activities across a wide range of community service organizations.

We actually have a young engineer here who is really into doing that work hand-in-hand with the high school. We gave them some financial support to that program last year and we're doing it again this year. And that's just one example.

UAH has the Alabama Science & Engineering Fair, which is where the top middle school kids from all across the state compete with their science projects. We're one of the primary sponsors because in addition to being a good corporate citizen, we have the same need every company in town shares – and that's our future workforce. There is a great concern inside Raytheon for getting more and more kids interested and involved in science and math, because of course some of these kids will be our employees one day.

The statistics show you really need them to be working into these learning and growth experiences by their middle school years to get them ready and motivated to pursue the math and science skills we need as a country.

From an education standpoint, that's not to say we only support middle school programs, we support all levels – higher education, high school, and middle school. Raytheon has a program called *Math Moves You* that is oriented toward that middle school level. We have Math Ambassadors who go into the schools and make that contact to inspire and motivate students about the opportunities related to the study of math and science.

We talk about the benefits that skill set can bring in the later grades and college and then maybe someday they're going to come in and work for Raytheon.

Being a major part of this community and making contributions to the community – both from a volunteer perspective and a financial one is something we emphasize.

PMI-NAC: *Given that many of our readers may not have a good understanding of the IBCS Program, can you tell us more about it and what you see as the most important “takeaways” you have to share?*

Mosher: Some people don't know who Werner Von Braun is right? Raytheon knows.

The reason I'm saying that is, we have a long history of supporting the Army Air Defense Community; and now missile defense and others as well. From my perspective, IBCS is about honoring that history and continuing our support of the air defense war fighter.

That's at a very high level. However, there are a lot of soldiers who depended on those systems in recent conflicts, and they will be able to depend on us going into the future.

We're excited to innovate above and beyond what we've done for 50-plus years in the air defense realm with products such as HAWK, Patriot, SLAMRAAM, JLENS and support for THAAD and many other programs. IBCS is an opportunity to enhance capabilities for the war fighter.

Those are good words, but what it really translates to in today's technology environment is an opportunity for us to go well beyond Raytheon and integrate the best technology in the air defense community.

This is an entrepreneurial town. There are 5,000 small companies in the Huntsville area if not more. The entrepreneurial spirit lives here. There are a number of technologies we use that frankly exist outside of Raytheon. Some of that technology is at big companies, some is at small companies. IBCS gives us an opportunity to say look, "What we care about is identifying best-of-breed capabilities and breaking down the stovepipes that exist between existing air defense systems and providing a common capability." By the way, a lot of that common capability is going to come from *outside* of Raytheon.

So, for us, IBCS is an integration effort. Take a collective community of learning and technology development that Raytheon has been heavily involved in for years, and bring other top firms to the table such as General Dynamics, IBM, Davidson Technologies, and Teledyne Brown Engineering – and that's just the beginning for us.

Plans are for the next IBCS phase to hold open conversations, to hold seminars with local companies, Small Business Innovation Research (SBIR)-like events, where the companies come in and we evaluate technologies to determine where they fit in the architecture. This is a different type of job for us compared to the work on Patriot and SLAMRAAM has been historically. At a technical level – and I know that this sounds kind of trite these days – but it's an open architecture.

Building architects believe in open architecture too when they build buildings. It seems to be the thing to talk about when you discuss military systems today.

You define the architecture, and we have an architecture process and certified architects in the company. This helps us get to things like well-defined interfaces and performance metrics – and then you plug in the best-in-breed providers. The challenge is – how you make all that best-in-breed – work together.

The fundamental underpinning of our solution set is an architecture that allows us to manage all the pieces and parts in that open framework that gives the best value to our customer and the most flexibility going forward on a technical level as well.

The warfighter is not going to get stovepiped into a proprietary solution in this approach. One of the benefits to Raytheon of doing this open architecture is that it positions us in the future for supporting our foreign partners as well. We're obviously focused on the current contract and requirements in front of us for IBCS. But we are looking at this with the vision towards the next generation supporting our NATO allies and friendly nations as well.

PMI-NAC: *Can you describe any project management principles and processes that you think make a difference for Raytheon on today's high-complexity programs?*

Mosher: Our most fundamental principle is – *people matter*. That's the core for us.

And the team matters. So I'll turn from a process perspective to address these points.

When we talk about processes – and we have a lot of world-class processes – we apply them uniformly across 73,000 employees as we do our projects. That's a big deal for a big company. We've got more than a few review councils, and we're constantly refining our processes to accommodate details in our business. But at the end of the day – processes are only as good as your people. As long as our processes take care of our people – and allow us to deliver on schedule and on cost – that's really the fundamental premise that underlies the whole approach for us.

The only other point I would offer here is that a big tenet at Raytheon is the concept of "*knowing the details*."

Knowing the details means you understand how to do financial management, and how to talk project technical details over with the engineers; you understand "contractually" what the details are and so on.

There is a lot of responsibility heaped on the program manager. You've got technical, cost, schedule, and contractual components – and all of those come together under the program management function. It's easy to get overwhelmed. But we place an emphasis on constant reviews, constant management input and oversight on the activities at weekly, monthly and quarterly intervals with our business unit president and senior managers. So our processes are all geared towards making sure program managers and our entire team – know all the right details.

It's a bad thing if you get up at your review and can't talk about the details of your program. It shows you're out of touch, your program's potentially out of control, and so on.

Our processes includes things like earned value management, incorporating Federal Acquisition Regulation requirements, as well as making sure that we're doing the right things contractually – and ensuring deliverables are on schedule from an engineering perspective.

Raytheon's philosophy on program management principles and processes are that details are important to us – and that philosophy is sprinkled throughout all of our processes.

We try very hard to clearly define roles and responsibilities. We're in a large company and we have a heavily matrixed environment here in IDS. So we have a program office – but we pull from the matrix for engineering, contracts, finance, and so on. Understanding how we work and the roles and responsibilities that a chief engineer has versus a program manager versus our contracts lead versus our business manager is very important to us.

This focus helps us protect and develop the skills of our people and it's also geared to protect the integrity of the program. We spend a lot of time talking about who does what to whom to make sure that at the end of the day we're accountable as a team. It can be very easy in a matrix environment to not be accountable – and accountability is important for us because that drives results.

We have an integrated approach to program management. Something we call Integrated Product Development System (IPDS). IPDS is a Raytheon methodology that is based on our lessons learned over the history of the company.

We've got a lot of processes, so as a new engineer comes into the company, as a new program manager comes into the company, there are guidelines and there are processes. There are checklists and checkpoints to make sure we do the right things at the right level of granularity each step of the way for each meeting, review, milestone, and deliverable.

We have integrated up through web portals today so that you can pull up your EVMS data, and drill down to the lowest level of detail right from that web portal. We've invested heavily in electronic tooling as a company. That's important from the standpoint that it facilitates a distributed management approach. On IBCS – we are working in New England, Pittsburgh, Huntsville, and Arizona. The ability to have a program management process that ensures we know the details, our people are accountable, and they understand their responsibilities in this highly distributed environment can be challenging. Tooling is a key enabler for that and it's one of the things we invest in heavily at our company.

PMI-NAC: *So you get rich data feedback from this foundation to help you excel?*

Mosher: Yes. In many cases we expose IT directly to customers. In many cases our government customers are working hand-in-hand with us. For example, on IBCS we're doing that. We have a shared Integrated Data Environment (IDE) that is a shared web portal.

We have integrated various supporting technologies via the IDE (including Microsoft SharePoint) as well as engineering applications that we use. These tools enable the government to have access to the data that we're looking at so it's a joint effort.

PMI-NAC: *And the architecture you described – how does the customer relate to it?*

Mosher: When I say “*people matter*,” from a process perspective, we want to enable that knowledge transfer, and enable data dissemination to our customers. Obviously, there are some low level processes we don't directly share. We manage our team a certain way, but we don't necessarily deliver that.

On large programs like IBCS (i.e., more than \$100 million), working in a partnership with your customer, you're both looking at the same data and arriving at similar conclusions. This process is very important. So there's a level of transparency at the top level that's important to us, especially in a distributed environment.

The customer is under just as many pressures as we are. Different types of pressures but the only way this works is for us to view this as a collaborative effort. We're trying to meet the requirements and deliver what they asked us to deliver and get to the same place.

Our architecture contains many different “views” so the government customer can glean information and come to a common understanding / concurrence with us. One picture is never enough to answer all the questions about an architecture – so our process produces multiple views that allow everyone from the warfighter to the software engineer to glean value and understanding.

We utilize a combination of several different processes and approaches that include the Department of Defense Architecture Framework (DoDAF) as an example

PMI-NAC: *Can you elaborate from here on your philosophy about your customers?*

Mosher: From a process perspective – the DOD is pretty prescriptive. You will hold this sort of program management review; this sort of quality review, send monthly cost reports in and so on. Obviously we do all of that.

The challenge is – from a relationship perspective – not to get lost in the paperwork. We encourage our program managers to have constant dialog with our customers so we are looking at a program as a joint effort and not a “throw it over the wall” exercise.

I can't tell you that we have a process in IPDS that says “Be good to your customer.”

That's how we train people. That's another thing about Raytheon. We are very serious about training and education. We develop thousands of hours of training modules every year. That includes everything from Business Ethics to the C Programming language.

Some we get from the Wharton Business School, the University of Chicago Business School, and similar providers. We bring professors in on special topics. Everyone at Raytheon is required to constantly be learning new things.

Along with that is mentoring. We have a strong mentoring program that includes both formal and informal mentoring activities. People are encouraged to meet with mentors to help them with immediate work issues – but even more to help with career development and decisions that make a difference for the individual and ultimately help the bottom line at Raytheon.

Taking that approach of collaborative learning and growth, we try to share that outlook with the customer as well. We'll discuss things we're learning and work with customers to bring that back into our process we're engaged in every day. It's a two-way street.

We can't tell them we're concerned about scope creep if we don't understand the details, if we don't understand where our scope is. We can't tell them we're concerned about budget if we don't have our finger on the pulse of the exact status of the budget at that point in time.

So our processes are geared to making sure our program managers know their programs inside and out. The Raytheon tagline – "*Customer Success Is Our Mission*" – identifies our commitment and the driving force behind everything we do as a company.

So the only other thing I'd add – there is a huge thrust in Raytheon to do something we call "*Mission Assurance*." The United States has sailors, soldiers, pilots and many other military personnel – *our people – that absolutely depend on what we build*. Sometimes it's OK in the commercial world if a piece of software says "Reboot your computer." You really don't have that option if *A MISSILE IS INCOMING*. So the concept of mission assurance is "*it has to work every single time*."

It must be tested. You can't have failures. You can't have lockups. That philosophy is embedded throughout all of our engineering and all of our program management.

We have a quality discipline throughout the company to check and recheck to ensure everything is going to work as advertised every time.

So mission assurance, viewed from the commercial context – is not the same concept we have at Raytheon. I've worked in the commercial world so I can tell you that the concept is not the same. In many segments of industry, if something you do fails there is a little more leeway in many – not all industries – but in many industries.

PMI-NAC: *Your point here is we can't reboot our war fighters?*

Mosher: That's right. They have loved ones at home and they need to get back home to see them. From an IDS perspective, we have a phrase trademarked that emphasizes this point. It's usually treated as one word but it is "*No Doubt*." When the Warfighter is on the frontline and has to pull the trigger on one of our products – we must ensure there is no doubt it will work the first time and every time.

Most of the time, our customers don't get a second chance. We take our role in this very seriously. This view is applied in logistics, subcontract management, engineering and every other part of our business as well. The "*NoDoubt*" philosophy gets applied across the board at Raytheon.

PMI-NAC: *You take this to the extent of using CMMI and the other methodologies?*

Mosher: Certainly from a program management perspective, the ability to repeat success in a predictable fashion is important to us. So achieving things like CMMI Level 5, and IDS is rated at CMMI Level 5 – which is the highest level you can reach – is understandably very important to us.

We've been involved with the Software Engineering Institute (SEI) for many years now. We were involved with CMM before that, and now we're involved with CMMI and it is integrated across our hardware and software systems, and every part of the engineering we do. So it's much broader than just software today.

Fundamentally, predictable management and our constant attention to learning – are all integrated processes that are built into the way we do business. So there are a number of processes we follow that are best practices for us

PMI-NAC: *And does that approach include Lean Six Sigma as well?*

Mosher: That's a big emphasis of ours over the past eight or nine years now. And, in fact, on programs prior to IBCS, we're doing joint Six-Sigma projects with the customer.

We have an IDS internal requirement for everyone to be a Raytheon Six-Sigma specialist. We have black belts, we call them “*six sigma experts*,” and we have our own flavor of six sigma tailored to Raytheon. Every program conducts Raytheon Six Sigma projects and in fact IBCS, is conducting six sigma projects today during phase one. Our focus is all geared towards weaning out things that don't need to be going on – to make us more effective, and spend taxpayer money more effectively and efficiently.

That includes making us more productive as a team, and to make us safer. As an example we have presented multiple times to the local Huntsville customer community at the Lower Tier Project Office on the Army side – and certainly on every program Raytheon manages. So six sigma is a huge, constant thrust for us.

Every employee is given a period of a couple of months before they must be six-sigma certified. If you come into this company, that's one of the training points – get six-sigma certified in a short period of time.

PMI-NAC: *In your years managing defense projects and business operations with Raytheon, are there lessons learned about how to manage people, projects, and technology you can share with our readers?*

I'll come back to something I said a minute ago, that “*people matter*.” That's my personal perspective and I've worked at Raytheon for a number of years now. Before that I worked for Dean Kamen (who invented the Segway Scooter and a bunch of other things) directly up in New Hampshire. I owned my own software company before that. I worked at Cabletron and other firms prior to that. So I've experienced a number of different corporate cultures.

One thing I would tell you is something that is universally true in my experience – it really cuts across the board – is that people matter and you have to take care of your people.

From a philosophy perspective, whether you're inventing Segway scooters or building missile defense systems, at the end of the day, your success depends on your team.

People write management books about it. I've seen it referred to as the "*servant-leadership model*." That's what John Maxwell calls it. It's the opposite of the entitlement management philosophy. You support your team – and they're going to deliver for you. This applies not only to the team – but my program peers.

I strive to treat my program management peers within Raytheon the same way that I would want to be treated. And they're going to come to me on my off day and ask me to help with a problem, and I'm going to say "absolutely, of course." Because I will never know when I'll have "*the problem*" and need their help as well. So there's interdependency. We talk about interdependency a lot at Raytheon.

There's interdependency between our teams, our peers, and our senior management as well. And sometimes it can be an us-versus-them perspective when you look at the next levels of management.

I look at these situations and try to work for the *win-win* solution. Make it a win-win for my team, from a personal career perspective, and from a program perspective; and I want to make it a win-win for my peers as well. What challenges are my senior leaders are facing, and how can I help support what they are doing as well.

From a personal philosophy, I always come back to the fact that the most important asset we have on any project is our people – and that extends to all of our customers as well. In the DOD, our customer community certainly faces their own set of challenges.

It's not just a single person that runs the program in Raytheon or on the government side. They have a whole set of people that surround them and their team needs to be successful as well. In addition to the fact that in defense there are all sorts of external pressures that government program managers are facing. Whether it's Office of the Secretary of Defense mandates, new guidance from the Secretary of Acquisition, or congressional mandates or other things of that nature.

So it's working hand-in-hand together and it's how we make our customer successful at the end of the day. Obviously we want to deliver on time, on schedule, and on cost. That's the fundamental requirement. The way you get there is through the people and supporting your team. I would say, it's the flexibility to find the win-win in every situation. There's going to be challenges in every situation. There are requirements changes, budget changes; there are personnel changes on our team, on the government's side – a new administrations come in every four or eight years.

There's always change. That a key constant. So, for me, personally having the flexibility to roll with the punches or keeping focused on the cost, schedule, performance – and keeping focused on your people – is the key to success.

If we go into program management with a rigid, "*we've always done it this way – we can't do it any other way*" perspective – and it's very easy to fall into that viewpoint because it's comfortable – then it's potentially fatal for your program's success.

Ultimately, you're doomed to fail with that approach. Just like an automotive bridge, without the flexibility to withstand a gust of wind, it will collapse. The same thing goes for a program. If you can't build a team that has the flexibility and ability to maneuver, your team is going to fail, your customer is going to fail, and you are not going to deliver the right solution on time, schedule, and budget.

PMI-NAC: *How do you get your team out of the box when they need it?*

Mosher: It starts on day one of the program. And that day one is setting your vision for the team. The vision to me invariably includes *work-life balance*.

From a personal level – you want people to not be worrying about what's going on at home. You want them to interact with their families and to be successful from that viewpoint.

Because when the times get tough and the extra demands are really there for the program to really get us up and over the top – we need our people to be on their game. So you start with the work-life balance philosophy.

It comes from walking around and talking to your team. If you are in a distributed work environment that gets a little harder. Understanding the fact that we have processes to keep us on cost, on schedule, on performance, and knowing those processes is a good thing. But understanding the intent of those, and getting us to the same place – is just as important.

In other words, just because a piece of paper says you have to do X, Y, and Z – and those are important things that we have to follow – but at the same time, if the intent is to deliver something on cost – we can probably get there without following the letter of the law exactly in some cases. Maybe a better way to say that is *I encourage people to think about what they are doing – as opposed to the piece of paper that tells them what to do*.

As an example, I did this to my team. I have a staff meeting every week and this past week I introduced a thing I call "*Big Thoughts*." Everyone for 30-60 minutes of your own time this week – I want you to think about something that's not related to our program. And I put up a video, actually a Dean Kamen video in this case, where he created an arm, an artificial arm, and in a matter of months – for soldiers who lost limbs in the recent wars. So we're starting to fill that electronic folder. *Think about big thoughts*. Think about innovative things. Things that have absolutely nothing to do with what you're doing today and that are innovative.

We are consistently looking at ways for software developers to be more productive. To be more innovative. We're constantly looking at ways for our system engineers to leverage work that they have previously done rather than redoing the wheel – the same algorithms from program-to-program-to-program. So from an innovation perspective it's a challenge.

There's no question we have all the processes in place, good processes that will help us manage our program in the way in which we are required to manage the program.

But we also must protect the “*natural, entrepreneurial, native spirit*” people have that is so essential to our success.

And above and beyond that – how do we get our people heard?

You can have people sitting at a lunch table having a wonderful conversation on innovating something for your program – but you might never hear about it because you were not there to listen firsthand.

This is not just my approach, IDS tries to cultivate a culture of trust that says: “*You're important to me. I want to hear about it no matter what.*”

Whether it's a problem or an innovative idea – I tell it to every one of my leads: “We want to hear about it. You need to encourage your people to talk to you. You want to pick their brains for the innovative ideas that we all have.”

As IDS, we set up a group called Mission Innovation. The goal of Mission Innovation, and it's small group of people, is our people go in there for a couple of years, and it's a rotational position, mid-career folks usually; and they go in and they are required to come up with the off-the-wall ideas and really let their minds flow freely. Then we rotate them back into our programs and hopefully the innovative spirit they've developed there goes with them. For example, MI came up with using bees to detect certain chemicals related to WMD.

That's not something you run across every day. Someone else talked about using radars to get oil from shale out in the Midwest.

We've got another group called Advanced Technology that extends innovative concepts to actual contracts. So there are some really creative ideas that come out of that. AT had the active spectral portal (ASP) – the program involves a bunch of columns that you drive Mac trucks through to detect nuclear materials at our border crossings and so on. Really interesting, innovative work.

We've tried to create a culture of fostering innovation. We've set aside specific ways to help our people foster innovation. We have something in the company called the *Idea Program*.

If an engineer, and we have 40,000-plus engineers, has a good idea they are given money to go develop that idea. Sometimes it's \$50,000 or more – significant amounts of funding. Here, go develop a prototype, go develop this idea. And then when they get to the end of their bucket of money – we evaluate it. Do we want to take this to the next step?

So we are constantly looking for ways foster innovation. And it's particularly challenging from a labor perspective. You know, here in Huntsville there's a lot going on. We can thank NASA, we can thank BRAC, and we can thank the Redstone Arsenal and the Army.

As a result of that, there's a lot of good work to do down here and we want Raytheon to be *THE* preferred place to work.

We're always going to face challenges. But on the staffing front, if we don't make this a fun, exciting, innovative place to work – and at the same time continue to deliver on all of our contracts – we're in trouble.

PMI-NAC: *You have a lot of worthy competitors here in town.*

Mosher: There are top competitors in every category. Whether it's big competitors, who shall remain nameless, that you could hit with a stone because they are all around us – or whether it's all the small companies around here – Raytheon needs to be that one innovator to retain and attract the right type of quality of talent to deliver on our promises. And we've been pretty successful at that so far. I think that from a challenge perspective over the next couple of years, as BRAC really kicks in down here, you know as everyone moves in from northern Virginia in the next two years – we're going to face challenges.

But, focusing on people, fostering innovation, helping our people maintain a work-life balance – while giving them interesting work to do – is my winning formula.

I would say one other thing from a lessons learned perspective – this is also something I start off with day one on my programs – which is: *"Bobbleheads are not welcome here."*

That's kind of the tagline for how it is around here. If you are just going to tell me “yes” without pushing back with legitimate concerns, if you are not going to bring up issues as you see them – that's not the culture we want.

One of the big lessons we've learned is that we want to raise issues. There are always issues that come up as you execute large complex programs. We want people to trust us enough that they feel able to raise those issues to us. And we encourage that.

That perspective is linked deeply to our ethics. On the ethics side we have a dedicated ethics office and everyone has required ethics training every year so we keep that focus.

But even just everyday run-of-the-mill programs concerned that a software build might not come in on time, concerned that we're not getting this equipment that we need – our people need to feel like they can go talk to their management about those issues. Because it's the blind spots that will kill a program.

That's probably the single biggest lesson learned I know – *encourage a culture of trust*. It keeps coming back to people. I keep reiterating that, but encouraging that culture of trust, where we trust each other enough to be able to raise the hard issues as they come up.

That approach comes out of a number of independent studies from a DOD perspective of program failures and successes. Often, the term “lessons learned” is used in a negative way. But for me, positive lessons learned are where we've been able to create that culture of trust and innovation and support people's work-life balance – and we get tremendous results in our programs. That's a huge lesson learned for us.

We have a corporate team that goes and looks at every program in the company and then evaluates why this one succeeds and why this one might need some improvement. Why did this proposal not go the way you wanted it to go? We are constantly reevaluating ourselves from that perspective. And we maintain an internal lessons learned database for each core discipline as well as program managers.

PMI-NAC: *We've seen growing interest in Agile methods here in Huntsville. Is there place for Agile and similar methods at Raytheon?*

Mosher: It does matter. The ability to be flexible and the ability to manage requirements are important to us. Agile provides teams with the capability to deliver the right product at the right time.

Now when you talk about Agile in terms of large distributed programs there are challenges.

Are we running IBCS as an Agile program today? No, we're not – but Raytheon is running some programs using Agile methods.

In IDS, we just opened a new center in Sudbury, Massachusetts with 4,000 square feet of Agile work space – no offices – and we have daily scrums. We're doing this in conjunction with Microsoft.

This is a joint project with Microsoft on refining our software processes. We are always looking at our software processes. Part of that is customer acceptance. As the SEI leads the DOD down the path of software product lines and Agile and similar things – we are constantly working with the folks at SEI and Vanderbilt University and we're constantly looking at the latest methodologies and processes.

For Agile in particular, we see applicability on smaller programs right now. We haven't found the magic touch point to make it work on a huge program yet. So it's a mix. If you asked us how we are doing software today versus 15 years ago – it's very different. And if you asked me 10 years from now are we doing more Agile projects – I'd say "more likely."

So it's an evolutionary thing. It's done in conjunction with our customers. The customers have to be comfortable with it because Agile requires constant customer interaction. So where we have programs that were successful at what I was talking about with treating a customer as a partner, and it's a win-win, Agile works well for certain parts of it. I would tell you – every Agile attempt hasn't been fully successful – but we're constantly looking at how to apply it as we gain more experience.

The ability to innovate and let people be the best that they can be should be supported by the process. Agile has the capability, when you have a small team, to work very, very well, and we are using it internally. We are looking at how to expand that, if quite frankly, it can be expanded to larger programs.

PMI-NAC: *Given your experience with and understanding of DOD / defense business in Huntsville today – what motivates you the most about our business opportunities and challenges in the years ahead?*

Mosher: Here's what I would say – budgets are always under pressure. I know we just had an election. Quite frankly, the election matters and it doesn't matter. Budgets are always under scrutiny. Priorities change in the defense business right?

The world situation changes and long-lead plans have to be changed at the last moment. So budgets are always going to be under pressure. That's the first thing I would say.

Huntsville has been, and will continue to be, at the center of a lot of federal dollars. And I mentioned some of them earlier. Thanks to the Army, NASA, Redstone, and BRAC – a lot of people have begun to relocate here. There's lots of business here in Huntsville.

You add in the fact that it's an entrepreneurial town. I keep talking about this. You know for whatever reason, I don't know exactly what the magic formula is, but Huntsville has people who like to innovate, who like to do their own thing, to create small companies and do what they like to do. Even Huntsville folks that work in big companies like Raytheon are very entrepreneurial.

So at the end of the day, I keep coming back to it but – *people matter*. The business opportunities will focus more and more on how we deal with meeting expectations for corporate growth in a tough macroeconomic environment. Business pressures I was talking about before.

And the key to not becoming the next corporation of yesteryear – and you can choose the names you want – depends on how we foster innovation, how we listen to the innovators, and how well we keep our innovators engaged with our customers.

Huntsville is a challenging environment because of this combination – lots of business, lots of talent, and lots of entrepreneurial spirit. And we're committed to Huntsville, and we really think as Raytheon continues to win and deliver on programs like IBCS – and we have some 28 acres here now – we have plenty of space for more innovators and buildings.

So our challenge is to grow the business, tap into the entrepreneurial spirit and innovation that's here naturally – and we'll be really successful as a company.

And by the way, that's a *win-win* for the community as well. As we're more successful, we feed back to the community as I was talking about at the beginning of our visit, in providing a place for people to feel comfortable with doing what they love to do.

And at the same time – it's very important to our country.

Why do I work at Raytheon? It allows me to be free. It allows me to be innovative.

And I'm doing important work with colleagues and customers that trust each other.

As long as we focus on those aspects – I think we'll continue to attract the right kind of people to join us here at Raytheon.

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