IBM Podcast

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MATHENY: Welcome to this IBM podcast. What is product line engineering? I'm Angelique Matheny with IBM. It's not easy to build a smarter product. Now try to build more than one at a time while planning for the next release or client trend. The reality is no one builds just one, and while technology is a driver, it can also be a hindrance as more and more complexity is introduced into the development lifecycle.

Now, think of the role of software and all the variance and combinations that can be introduced at the drop of a hat, and you've got a dichotomy between business and engineering, not to mention the cascading effects that are on our mechanical and electrical engineering disciplines that can't be ignored.

Tools are no longer enough. Companies must seek industry best practices to design and deliver and manage these smarter product lines.

And joining us for today's podcast is Greg Gorman, Program Director Worldwide Systems Engineering Strategy and Delivery with IBM Rational Software; and Nicole Katrana, product line

engineering market lead with IBM Rational Software as well.

And we'll learn how the Rational Solution for Systems Software Engineering can provide an integrated lifecycle solution for variation management and product line development. Hi, Greg. Hi, Nicole. Welcome to the podcast. Thanks for joining us today.

KATRANA: Thank you for having me.

GORMAN: Thanks.

MATHENY: So, Nicole, you know we're covering managing the complexity associated with building a product line. Maybe we should start with Product Line Engineering 101. Why is this topic getting so much attention?

KATRANA: Well, Angelique, the reality is no one builds just one of anything anymore. That's what we're calling mass customization. It's become the norm, customers are expecting you to deliver exactly what they want. That's regardless of the industry.

I mean, we're seeing that in the mobile phone industry, the automotive industry, think of aerospace and defense. Nowadays companies are building multiple variants or different versions simultaneously.

The perfect example is the Hummer or Jeep. You could have a commercial vehicle that somebody like the masses like you and I would buy or you might have a military version that's being developed at the same time.

Now, think about the hybrids, the diesel, the gasoline versions. There might be certain fuel emission standards that you have to cater to depending on what country you're focusing on or the different regulations. And we have not gotten into the e-commerce side where you talk about the features and customizations taking place at the consumer level.

But I think you're starting to get the idea the fact is that the companies that are building these smarter products are no longer building one; they have to take into account all the different variations that their consumers are going to want.

And then the reality is that a lot of this is being enabled by the technology that's available today. And software is driving a lot of that innovation, but the challenge that comes with that is that there's a lot of complexity associated with it.

And it's complexity in the engineering processes that

they've never dealt with before. So they're really looking at different companies that can help them deal with that. So with innovation comes complexity.

MATHENY: Well, that makes total sense. But the concept of building multiples of something is definitely not new.

GORMAN: It really is not really new. I mean, we've been doing it for quite a while when you look at maybe software variation, and people have done this for many years as far as creating duplicates and copies. And that's really what they're struggling with, is what are these cascading effects? When you create a new variant of something and you just blindly copy and paste, you really struggle within how do you manage changes or fixes or defects across all of those different variations, for example.

And then even expanding it farther into other engineering disciplines. So really you're starting to introduce a lot more complexity, for example, you want to introduce a mobile phone that has two cameras in parts of the world and one camera in another. Or perhaps you're doing different price points. So you want to define a bunch of modularity of a particular device, and you've increased complexity across the hardware domains, the software domains and other places.

So you've really exploded the complexities to meet this

demand of this hedonistic design, this customer-centric, customizability type thing that people want and demand, and then also be able to pick all these niche markets and try to dominate each one.

It gets to be a real challenge especially today when the realities are that people are really constraining and pressing hard on resources. These teams are highly stressed. Obviously you're trying to reduce the amount of engineering investment, at the same time increase the number of products you can make available to the market.

So there's this huge dichotomy of the amount of capability that an engineering team has versus the demand being placed on them to produce that kind of capability, those kinds of products.

And really that means you've got to look at this fundamental shift of, all right, since it's not going to work this way -- squeeze the balloon and something's popping out another way -- we've really got to take a new approach and a new look at our product development process, the methodology we're using, the way the teams interact...

And really, how can we more effectively reuse, grab the stuff that's been done before and not just blindly copy/paste it, but use it intelligently and be able to

extend current products or do minor variations of a current product that might be a real market winner instead of starting from scratch or a green sheet of paper every time.

MATHENY: So, Greg, can you tell me how is IBM helping companies deal with this new complexity?

GORMAN: It really goes a couple of different ways. One is in looking at how the business manages variance. And in our product and portfolio management area of our offering, we really help people determine where they need to invest.

And so we've got some tools that help you analyze those markets to be able to look at features and decide how those features should be connected together, perhaps in a variant; to be able to look at and ask questions and see ways of being able to combine these features into new products.

And I think really the mantra there is just because you can create a variant doesn't mean you should. Sometimes you walk into a grocery store and you see 25 different varieties of basically the same product, and really is that what you want?

I don't know, because then you're maybe overstressing your supply chain or your manufacturing chain or something else. So you really need to be intelligent about choosing which

variant you're going to build and then how are they being successful in the market. So that's one area that we're really strong in, and that's kind of, people have used the term analytics, and really that's something that we can really contribute in there.

And second, because a lot of this variant and the way that these products are able to support variants is through the software inside them. So they're incredibly complex products with a lot of software to make them drive and to make them work.

That's really where Rational can contribute as well. We're the world's greatest software development company, you might say. And we provide some of the best tools on the market to create these products and to help our customers in many different ways.

We have a lot of experience helping them, so we have a lot of best practices that we can bring. We have the products that are nicely integrated that can provide a good environment for people to collaborate together, to be able to easily share information.

And then we also have a strong systems engineering background so that we can help people look at the holistic picture to say, okay we're going to create these variants.

So let's look at the entire system -- hardware, software, electrical and mechanical -- and really take a good look at how they connect together, what's the best way to make them play, to be able to show and determine and understand how they're going to connect with other systems.

Sometimes that's called system of systems kind of approach, to be sure that whatever product and its variants that I'm working on will play properly in the bigger picture so that perhaps all of my mobile phones will in fact be able to make phone calls in the global wireless phone system. So there's a lot of other external pressures that we need to make sure that we can help manage and connect across all of these disciplines.

The other thing that I think we're really helpful in is in our industry practices. We've got a lot of experience in a bunch of different industries. We have people that assist customers every day in understanding their development process, assisting them in optimizing their process and being able to transform their process into something world class.

And we can bring a lot to offer I think in that space, but with our tool mentors and with our expertise, with some of our industry-specific practices and templates, and being able to assist people to really do a better job of working

under complex standards and demanding compliance and demanding regulations and all kinds of different industries. I think we have a lot to offer in that space.

KATRANA: Yes, and I think that becomes increasingly important as more and more companies enter different geographical areas where there is going to be different regulations depending on the country you're doing business with.

And as you take a product line out to, say, the United States out to Germany, you're going to have a whole different slew of things that you need to consider. So I think that having that industry expertise and then having that global presence and having the understanding of how companies do business in the other countries is going to be key.

MATHENY: That all makes sense, as I said before. So to get started, does a company have to totally overhaul their product development processes?

GORMAN: No, I don't think so. I think there's a lot of different ways people can approach this, and it really depends a lot on their need and where their pressures are. So there's a couple of different ways we can go. Of course, if they're a relatively mature organization and really need

that transformational approach, we have that capability.

But we also can take a step back and look at, okay, are there some small places where we can make some minor changes without disrupting the whole process and take a look at maybe you have a few variants, your processes aren't all that complex, we can do some simple things here and really help the process tremendously. So there might be this bang for the buck trade-off.

Now, on the other hand, we can also go in and say, you're at a point now where your organization is running pretty well. We've got them automated, we've got some good practices in place. Now let's take a different transformational approach and really, you might say, drive it to the next level at that point.

So really can look at it as the high/low strategy, and we call those entry points. So, for example, in requirements, we might be able to provide some additional best practices, some tips on using our tools effectively, to specify a set of requirements that can vary based on certain conditions, being able to help you trace those requirements properly into other parts of the business, and maybe just a small change or a small update like that can have a huge impact.

And then, on the other hand, some companies have been doing

that kind of work for years. They're the kind of companies where we've learned our best practices from and are ready to share that with other people. So the companies that have been doing that for a long time may want to go to the next level.

They're going to want to go and say, you know, not only do I want to integrate across requirements, but I want to integrate across maybe other domains in software development, electronics, in mechanical or in manufacturing, and say, I want to look at cross-discipline kinds of lifecycle integration and then automate that as well.

So it's sort of another layer of transformation that we can apply to the business. We have a couple of business partners, we have one especially that we like to work with that gives us a real powerful capability and set of tools called Big Lever, is the name of the company.

They have a set of practices and tools that extend our tool set to this enterprise-wide development environment so that we can manage variation and control it and document it and really leverage that variant capability quickly to respond to market needs as well has to get your arms around sort of this explosion of complexity when you start adding all these other disciplines in.

And really, they have a lot of experience in this place, and they can really help us out and help our customers out with being able to manage that complexity in these organizations. And really this decision -- where to start and really where to extend -- it really comes with a dialogue with us to be able to say...

Hey, you know, I'm experiencing this kind of pain in this area -- then we can usually map out a plan that says, okay, let's start here, let's start simple. Let's get this immediate thing fixed, then we can discuss perhaps the benefits perhaps of rolling out a larger transformation as we go across the organization.

KATRANA: Yes, I really do think the reality is that some of our customers are just looking for new and innovative ways to use the existing technology that they've already invested in, so really just understanding IBM's best practices and industry approaches is going to be key.

But knowing that there's a higher-growth strategy in place so that their investments are not going to go by the wayside is really important. Having the ability to deliver that lifecycle solution across the different engineering domains and the ability to know that IBM can grow with you as your product line grows I think is going to be key.

MATHENY: Greg and Nicole, thank you so much for sharing your time today. We really appreciate it. This was a great discussion.

KATRANA: Thank you.

GORMAN: Thank you for having us. It was great.

MATHENY: That was Rational's Greg Gorman and Nicole Katrana talking about, what is product line engineering and how IBM is helping companies build smarter products and product lines.

To share this podcast with your colleagues or if you're interested in more podcasts like this one, check out the Rational Talks To You Podcast Page at www.ibm.com/rational/podcasts.

And to keep the conversation going, Greg Gorman again will host a Webcast titled, Working Smarter Not Harder, Tips and Tricks for Strategic Asset Reuse. We'll post a link to that Webcast on that page.

This has been an IBM podcast. I'm Angelique Matheny. Thanks for listening. Keep tuning in as Rational Talks To You.

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