O Porto em Conversa – Interview with Dr. Paul Nielsen

Pedro Castro Henriques (PCH): Dr. Paul Nielsen is Director and CEO of the Software Engineering Institute, a federally funded research and development center operated by Carnegie Mellon University, and the SEI develops software engineering principles and practices through research and develop which is transitioned to the broad software community, so SEI is working on the future of software engineering of processes improvement and this methodologies and the work they develop is shared with the community and is promoted worldwide.

The SEI is a global leader in process improvement and in network systems survivability and is also a key innovator in terms of software architecture, software product lines and interoperability and integration software intensive systems.

They provide direct support to more than 50 US government agencies, so we're talking about large and complex systems.

Since 2004 he has joined the SEI and has been overseeing the development and expansion of the CMMI product suite and its partner network as well as the sert which works on the network cyber security effort.

SEI now has over 600 employees and has operations revenues above 120MD annually, it has also lead its participation to an increase in research activities and expanding interactions with the most important key stakeholders, the customers and the global software engineering community, so we are very happy to have you here today dr. Paul nelson at the sepg Europe 2010 in Porto

Vitor Silva (VS) - So, we're recording this interview on the second day of this four day event, how is the sepg Europe conference going on so far?

Dr. Paul Nielsen (PN) - I think it's going really well, all of the attendees are really happy with the schedule, the agenda, but more importantly we're all enjoying the nice weather in Porto and enjoying the hospitality here in Portugal. For many of us is our first time in Portugal, so it's real special for us. We're eating the good food, listening to the nice music and enjoying the sunshine.

VS - This is a somewhat different conference than the others, because of the venue, it's in a faculty, not in a hotel, it has other partners helping with the conference...

PN - We thought we should try something different, and of course our friends from FEUP helped in offering this venue. We think it has actually been a very nice change and many of our delegates are very happy with that. It kind of shows a stronger relationship to university life and to research universities, which is part of our mission anyway and it's bringing out a different kind of people to some extent. We found here that by doing this at the university we have students passed by as we're doing our sessions and we're kind of peeking their interest as well, which is a very good thing, because they're the future man and women in software

engineering, so it's an extra special thing for us that way, and just in general we have about twice as many attendees as we did last year in Prague, so we're very happy with that, to get our message across. Of course the portuguese community has specially come out in force, and we're making a lot of new friends here in Portugal.

VS - This kind of practice, CMMI and others, it's not something that you learn in university, in your graduation, how do you make this transition...

PN - When you're in university, especially as an undergraduate student, no matter what the discipline that you're studding, there is so much knowledge that needs to be learn to provide a foundation... if you're in physics, if you're in computer science, if you're in engineering, if you're in history... you have certain foundational subjects you have to learn. so, much of the work that we do is more for the after graduation kind of continuous learning, and ends up being more practical than theoretical foundational work, so a lot of the work that we do is what you would learn on the job, or soon after coming on the job, to turn you from a general student into a real professional in your field. We found this to be an easy thing to do and nowadays in almost every scientific and technical field you really have to learn throughout your life. So we're sort of in that continuous education, continuous training mode right now.

VS - I would think that CMMI and other methodologies are best sold to top managers and leaders that need to understand or to measure what is going on in projects...

PN - it's interesting that you bring that up because, because our name is software engineering institute, a lot of people think that all the products that we bring out, all the work that we bring forward is extremely technical and pointed at the engineers themselves, and yet CMMI and some of our other techniques area kind of in that world between the engineer and the manager. The manager is a person who should be very interested in CMMI because that helps is whole organization grow and develop its organization maturity as well.

VS -...my theory is that is easier that explain that to managers than developers...

PN - Sometimes, sometimes that's right. We found that managers, what they are looking for is how do they get an edge, how does their organization get an edge on ROI, on productivity, on quality. And these are things that CMMI continues to harp on, to stress. That it's not a value onto itself, it's a value because it increases your productivity and the quality of the work that you give out. And if you do that than your customers are happier, because you're bringing you're product faster, you're bringing you're product out with less defects and you're bringing your product out cheaper.

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VS - It's interesting that you mention being more market-responsive, to get products faster, and build better products, but you don't usually associate that with this methodologies, we usually think more of agile, the agile movement...

PN - Well, we're probably aren't the best people at choosing our names but CMMI does really help agility, and in fact, CMMI and agile work together very well, because CMMI is sort of a overarching technique for how the organization is organized whereas most of the agile techniques or even our own team software process are things aimed right at the individual programmer and the groups of programmers. So CMMI provides this umbrella and then Agile or TSP or extreme programming works at how the individual programmers do their work. What CMMI does is provide the institutional infrastructure so that the organization can keep learning from the projects that each individual is doing underneath them rather than have that good corporate knowledge kind of go away after the project ends.

PCH - here in Portugal we just had our first CMMI level 3 company that was certified by a portuguese company and is now heading to CMMI level 5 and also they are going to be certified on CMMI for services. In the world they will be the eleventh and in Europe the third to be certified.

VS - How do you see these companies like Pedro's strongstep that support other companies that want to use this methodologies.

PN - SEI itself is only 600 people and we wouldn't have the worldwide impact that we have if it weren't for our partner network of organizations like his company, this organizations help bring our work to the individual countries in the world, to the communities in the world and doing it with an understanding of the local culture, the local language and the conditions in the community. So we do travel ourselves around a bit but it's very important that we have the local partners.

Two weeks ago I was in India meeting with many of the Indian software companies, and India is a long from the US, it's a nice trip to Portugal, it's only half the way to India ...and the indian companies... what a big story. India has made so much progress over the last fifteen, sixteen years and much of it is due to their software companies that have done so well and their software companies would say, and they have told me, that they owe much of their success to CMMI which has helped them establish their quality in the world market. One of the companies I met when I was there was Infosys, 42billion dollars in market capitalization right now, about 5 billion in revenue a year; they now have 110 thousand employees. I visited them three years ago, just three years ago they we're 50 thousand employees, so in three years they've added 55 thousand employees or so, It's just amazing, they are hiring 20 thousand people a year.

And that's just one indian software company.

VS - Do you think that we can learn something from them...?

PN - that's one reason why we continue to make contact with them, because, and this is another important thing that it's important for you listeners to understand, SEI doesn't develop this work in a vacuum, we're in full contact with the broad community, and even as we bring stuff to the community, we learn from the community, so when I deal with Infosys they are telling me ideas of what we should do next, what they think would help improve our products. When I work with people here in Portugal we're learning about what's working in Portugal, how that can apply to the rest of the world. This is really a challenge for the whole software community, and we're just working as sort of a steward, kind of helping the whole community bring this work forward.

VS - It seems to me that one of the main targets or opportunities for these methodologies is the public sector. What does the public sector gains in having their suppliers that are CMMI certified?

PN - Well, in many places the public sector has used this as sort of a mark of quality for people that actually bid to do projects for them. So that is why the indian software companies have been successful with this because it helps them a lot in establishing their quality. In the US people use this the same way, sometimes contractors even use it for theirs subcontractors. We found too that if companies that are working together on a project, if they are familiar with CMMI, each of them, it helps them meld together on that project together, and nowadays in many parts of the world teams form up to do a project and then they split apart and then another team comes up for the next project, CMMI helps form that common language that common bond for this companies to work together on projects as they come by.

In addition we found that in the public sector there are some parts of the public sector that develop their own software in the US the navy, the air force do some of their own internal development and in other countries of the world sometimes the government does its own development so it can use this for itself as well and then finally as was mentioned by Pedro a second ago that we did come out with this extension of our model to cover the services sector which is really a big sector in the world economy, most government jobs really are service jobs and so we think CMMI for services would have great applicability to the government itself to figure out how they can do their jobs better and organize themselves better

VS - This approach is not for the startup, is not for the small shop, we're talking about large companies.

PN - Well we have use it in small settings as well, we've actually worked with the European Software Institute to look at how to do this in small settings or in clusters of small companies where they can sort of help each other out a little bit, it's been successful, but we've also found out that we have another product that we call the team software process that is very successful for small companies and it's compatible with CMMI but a little bit different and its really design to companies with 2 to 10 people to kind of the work they need to do.

VS - And it's usually to be used with complex systems...

PN - CMMI was initially developed to do the really large systems that governments tend to do, maybe in the defense department, maybe in the telecommunications world, air transportation, and so there are lots of special features in these really large programs, but the methods, the ideas, the concepts that are in CMMI work on smaller projects as well, the key in much of what SEI has done could be summed up in that we try to build quality in rather than test quality out, we find that if we build quality in at the beginning of a project it reaps rewards in cost, efficiency, productivity, customer satisfactions that's kind of our total gold all the time.