



Presents
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Focus on Pekka Forselius
A CAI State of the Practice Interview
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Biography of Pekka Forselius

Pekka Forselius is a researcher and developer of project management methods and concepts, including FiSMA Scope Management, FiSMA 1.1 FSM method and KISS Functional Size Measurement approach. His research speciality is organisational learning, in particular corporate memory and benchmarking. He is currently business partner, CEO and project management consultant at Software Technology Transfer Finland (STTF) Oy. He is also Vice President of the international benchmarking organisation ISBSG and a member of the executive committee of the COSMIC consortium. Pekka is the developer of the Experience Pro data-collection concept and is the product manager of Experience Pro software, a tool for software project scope management. He received an MSc in informatics and an executive MBA from the University of Jyväskylä. Our interview between Pekka Forselius and Michael Milutis, Executive Director of the IT Metrics and Productivity Institute, took place in December of 2006.

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CAI: Could you tell us a little about yourself, your background, and what you are working on today?

PEKKA FORSELIUS: I have 25 years of experience in software development and the IT industry. I began my career as an operator and have worked along the way as a programmer, systems analyst and project manager. I had a 15-year run at Finland's largest commercial bank, where for many years I headed the project office. It was at the bank that I learned how to analyze different projects and began understanding why some projects were succeeding and others were not.

I was introduced to function points in 1987 and I started to apply them in the late 1980s. In the early 1990's, many Finnish companies were gathering together around the IT Development Center of Finland. Among these companies, I remember there were 16 that had tried and used function points and were quite happy with the results but were not really entirely satisfied with how they worked. That's why we established a national project aimed at improving functional size measurements and also at developing some other metrics that we felt were important for project estimation and for understanding productivity differentials.

For the last 10 years I have been a consultant. I am the CEO of Software Technology Transfer Finland and also one of the partners. We provide consulting and training services focused on process improvement, software process improvement, and project benchmarking.

CAI: We frequently hear that less than 20% of software development projects within large organizations are succeeding. In your opinion, what are some of the root causes for this problem? Furthermore, why is it that these kinds of failure rates have been tolerated for so long in our industry? It seems unique to IT and software.

PEKKA FORSELIUS: I think the biggest problem is scope management. Neither customers nor suppliers understand scope very well. One reason for this is the lack of competition. If there were more competitive markets they would be forced to concentrate on scope, but without that framework in place they wind up slipping into a kind of artistic process when they develop software.

We have already gotten very good results from scope management. We started by splitting large programs into smaller and more manageable projects. That also means that these projects become more measurable. When we leverage scope management principles, it's very seldom that projects fail. Using scope management techniques, the best companies have shown that they can keep their schedule and budget within plus or minus 3 percent of the target.

CAI: By project failures we mean not just projects that fail outright, but also projects that come in over time or over budget. In light of this, I think it's fair to say that better estimation practices would help us bring more projects in successfully. Do you agree with this? Do you see estimation as a core problem? If so, why do you think that estimation has been such a difficult area?

PEKKA FORSELIUS: I think the core problem with estimation is requirements management. It's very difficult to make good estimates if the requirements are bad. I think a scope management approach guarantees that the requirements will be good enough, and functional size measurement and function points are all part of scope management. And if you can't measure the functional size of a piece of software, you can't develop it. Therein lies the problem.

CAI: You mentioned function points several times. Could you elaborate on some of the other measurement methodologies that are in use today, differentiate them, and maybe even comment on why you feel that the function point methodology is the best or the most appropriate?

PEKKA FORSELIUS: There are several functional size measurement methodologies. There are IFPUG function points, NESMA function points, COSMIC function points, also FiSMA and the Mark II. All five of those are conformant with ISO standard 14143. And any one of them will be good enough for size measurement. But size measurement is just one dimension of an estimate. I would say that it contributes about 25% to a good estimate. We need some other metrics as well. We need other metrics that can help us gain an understanding of the factors that influence productivity of development projects.

CAI: Could you be more specific?

PEKKA FORSELIUS: There is a method out there called situation analysis method. The name of our most popular method is FiSMA ND21, meaning "New Development and

21 Productivity Factors.” We have been using two different situation analyses, and they are very similar to COCOMO. COCOMO has 23 factors. There are also value adjustment factor analyses within the IFPUG and Mark II methods that are kind of situation analysis methods.

CAI: When you say situation analysis, what you mean is that you are trying to understand the environmental factors that might be impacting the productivity of a team so that you can develop more accurate estimates.

PEKKA FORSELIUS: Correct.

CAI: You are saying that it does not come simply down to sizing, that there are other elements that are going to impact whether a project gets done on time or within a certain period of time. For example, it might be the amount of experience that a team has with a certain technology. It might revolve around the organization, or the culture, or the tools. Is this correct?

PEKKA FORSELIUS: Yes, exactly. We analyze the total circumstances of the development project and we have 4 sets of productivity factors. The first set revolves around how the project is organized and how the customer is involved. The second set revolves around how the development process is managed as a whole. The third set revolves around product factors, i.e. what kinds of quality requirements are necessary for the target software. And the fourth group covers people factors, such as the experience of the project manager or the cooperation schemes of the team.

CAI: So this is the Situation Analysis Method. Is it proprietary? Is it your own creation?

PEKKA FORSELIUS: It is a collaborative project among FiSMA organizations. The first lesson was published in 1991. These lessons are publicly available, by the way; anyone can download them in English from the FiSMA website.

CAI: Could you spell that please, the website address?

PEKKA FORSELIUS: HTTP://WWW.FISMA.FI. It stands for Finnish Software Measurement Association. In the future, I think that the name will be changed to Finnish Software *Management* Association. That's because the measurements are meaningless if they are not being used in management.

We started out with a focus on function points about 15 years ago. That's because they were not good enough and were in need of improvement. Then we needed other metrics and so we concentrated on the development of new metrics, such as the situation analysis method (plus some others). After that we focused on measurement processes, so that people could have a meaningful framework for using the metrics. The next phase in improving these measurements involves management. We have been progressing step by step.

CAI: What exactly do you mean by "management?"

PEKKA FORSELIUS: By management, I mean – for example - concentrating more on benchmarking and benchmarking related questions.

CAI: You said you started with metrics and then went to processes. Why are processes so important that they preceded your focus on management?

PEKKA FORSELIUS: I was talking about measurement processes. What we discovered was that people in these organizations couldn't use their metrics because nobody explained to them how to do it correctly. People were trying to use the metrics in very individual ways, and that's why there were so many failures in function point counting.

Also, another problem was that many project managers only tried to measure function points and they were disregarding a lot of the other aspects of the measurement process.

CAI: You mean the environmental factors?

PEKKA FORSELIUS: Yes. Also, reuse analysis and risk analysis. And they didn't know how to use experience databases or how to use repositories.

CAI: So if you had to highlight the most important processes, what would you say they were?

PEKKA FORSELIUS: Measurement processes and scope management processes.

CAI: Could you summarize a few key measurement processes for us?

PEKKA FORSELIUS: In the beginning we have to initiate the project and initiate the piece of software that will be developed. That's one key process.

After that we have to estimate the effort, cost and schedule of the project.

After the estimation processes we get to our core processes. This is where the development of software starts. During the development period we have two primary measurement processes, the change management and control processes. With change management, we can propose changes and calculate their impact on estimates. During the control process, we count the earned value in function points. We do this every month - or even more often depending on the project - but typically once a month, and what we are measuring is how many function points are delivered.

Finally, in the end of the development lifecycle, there is a step that involves closing of the development project. This entails measuring the actual productivity from the project and collecting the data for our database and then reviewing the results of the project.

CAI: Is it possible, in your opinion, to build up an organization around those key processes that you just outlined without making a significant investment in tools?

PEKKA FORSELIUS: I started with a piece of paper and a pen. I also had data collection forms when I was working in the bank and seven folders full of project data. Nevertheless, I think that certain kinds of tools can be very useful for process improvement. For example, change management is quite difficult if you can't change the estimate easily, and tools can help there.

If you have many projects or simply difficult projects, tools can usually help.

Tools are always giving exact taxonomies and exact choices for variables; consequently, if you don't have a tool when you input the data, if you spell it wrong or make it a little bit different, you will have data quality issues. That's another advantage of tools.

CAI: Once people or organizations figure out how to put these things together and understand the processes that they need and can find a way that makes sense for them to collect the data, whether it's manually or through a tool, and once they start being able to make progress with this, what are some of the advantages? Clearly, benchmarking is one - you will now have the ability to benchmark, both internally and externally. What are some of the other advantages?

PEKKA FORSELIUS: That's a very good question, because measurement itself or data collection itself is not important without having goals. We always need a goal. And the most successful companies in Finland, companies that are suppliers, usually have goals related to better customer satisfaction or to improving their customer satisfaction. If there is a competitive market and the customer satisfaction is not very good, that will be a problem for the supplier company, and accurate estimates are tied-in directly to this. Productivity is another primary target, but accurate estimation is even more important.

Of course, profitability is important for suppliers, too. I know a few cases where there have been some serious failures with fixed price projects. That has been a major incentive for learning how to estimate better.

CAI: You mentioned productivity. Could you comment on the current productivity trends today? How would you describe the state of productivity? Data seems to suggest that we have not really seen any kind of significant increase in productivity in our industry for the past 15 years. I'm wondering why that might be. What do you think we need to do over the next 5-10 years to see improvement in this area?

PEKKA FORSELIUS: I myself have actually seen productivity improvement, but not directly. I have seen it when organizations start to use unit pricing in their development, e.g. dollars per function point or Euros per function point. This concept, called SouthernScope, was originally developed in Australia by the Victorian State, and we have improved the approach a little in Finland, and it's getting more common every month. Our NorthernScope is leading to better requirements and more realistic customer expectations. When the price is based on function points, then the customers will hesitate to propose all kinds of changes during the lifecycle and that winds up keeping the scope much better managed. The results are amazing. In Australia they succeeded in decreasing the average price from 1500 dollars per function point to 500 dollars per function point, and we have achieved very similar results in Finland, where the average price is dropping from 1000 Euros per function point to about 300 per function point. And that means improved productivity on the supplier side, not just cheaper price. The productivity comes from better requirements. They don't need better tools or better toys.

CAI: Could you talk about some of the better books out there, some of your favorite books that you could recommend to people who are interested in this?

PEKKA FORSELIUS: The most recent ISBSG books are very good. The *Practical Project Estimation* 2nd edition published in 2005 - I recommend that to all project managers and anybody who has to understand project estimation. I'm also using that in my training courses. The other good book from ISBSG is *Software Metrics Compendium*, which is just a year older and which has a lot good stuff in it. The third book that I could recommend to people who are interested in understanding software

data is Katrina D. Maxwell's *Applied Statistics For Software Managers*, which was published in the Software Quality Institute Series by Prentice-Hall. It explains in great detail, and makes it very easy to understand, the importance of data quality. Katrina has been analyzing our Finnish database and European space agency data and the case studies she uses in the book are based on that.

Questions? Suggestions? Comments? Please contact the IT Metrics and Productivity Journal Editor at michael_milutis@compaid.com