



**Presents
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**Focus on Bernd Hindel
A CAI State of the Practice Interview
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Biography of Bernd Hindel

Dr. Bernd Hindel, born in 1960, studied computer science in Erlangen-Nuremberg and Green Bay (USA). After his doctorate at the University of Erlangen-Nuremberg in 1991, he worked for the Central Research and Development Department of Siemens in Erlangen. From 1995 to 2000 he was Managing Director of a SME Software Company. He has been the Chief Executive Officer of method park Software AG since 2001 (www.methodpark.de). Under his leadership method park has received several prizes: TOP JOB 2004 (innovative human resource management), IHK Founders Price 2005, and Bavaria's Best 50 (fastest growing companies).

In addition, Dr. Hindel is a Lecturer for Software Engineering at the University of Erlangen and the Automotive University of Volkswagen, Wolfsburg. Dr. Hindel is also the founder of the ASQF e.V. (Association for Software Quality and Training www.ASQF.de). He was President of the ASQF from 1996 to 2007 and founder of iNTACS e.V. (international Assessor Certification Scheme for SPICE Assessors www.iNTACS.info). He was President of iNTACS from 2003 to 2005 and is currently a member of the advisory board of iNTACS. As a member of DIN Institute, Dr. Hindel is the chairman for Software and System-Engineering Standards and the head of delegation representing Germany at ISO/IEC JTC1 SC7. Since 2003 he has been the German representative at the ISO Working Group 10 which is responsible for the definition of SPICE. Dr. Hindel publishes numerous papers and books on software engineering. Our interview between Dr. Bernd Hindel and Michael Milutis, Executive Director of the IT Metrics and Productivity Institute, took place in 2007.



CAI: Tell us about yourself and what you are working on today.

HINDEL: I studied computer science at the University of Herlingen and the University of Green Bay, Wisconsin, and received my Ph.D. from University of Herlingen, Germany. After receiving my Ph.D., I worked for the senior corporate research department at Herlingen, where I first encountered the area of software quality. I was asked to define a software development process for a Siemens product shipped to the United Kingdom. It took 18 months to build such a development process and convince Siemens the project had reached maturity. After three-and-a-half years working for Siemens, I switched to a small enterprise of about 15 engineers, became the managing director, and over four years grew the company to 120 employees.

In 2001 I started Method Park Software, a company dealing with software quality and software process improvement employing about 100 engineers. Domains include the automotive and medical device industries. We work on process improvement and executing new methodologies. I focus on project management skills, because I think the key to better software engineering is effective management.

In 2003 I became involved with Software Process Improvement and Capability Determination (SPICE) as the head of the German delegation to International Organization for Standardization (ISO). I'm currently a member of the ISO team defining SPICE and international standards for software process improvement.

SPICE is more about management and organizing projects than technical issues in software development, and for me, management is more interesting than technical issues. We have lots of technologies and people capable of working with them, but to make these technologies worthwhile we need to organize projects more efficiently and communicate more effectively.

CAI: The Standish Group has reported 70% of all software projects come in over budget, over schedule or not at all. Why, after all these years, are these numbers still so bad? What do you think can be done to solve such issues and, more importantly, what do you see as the root causes of such chronic failure?

HINDEL: If you look at the Standish Group's CHAOS report, published every other year, you see the numbers are still bad, but improving. Today's projects are becoming ever more complex and expansive. Many projects cross both company and country borders, forcing several companies to work together to build a system. The CHAOS report cites this greater complexity as one of the reasons projects fail.

I believe failure is often due to misleading communication, misunderstanding, improper management and under-estimation of resources necessary to complete a project. Technical problems are rarely at fault. We must develop a different approach to management with specific expectations for both mature companies and learning organizations and an acceptable date for project lateness. When these issues are resolved, we may see improved numbers in the CHAOS report, despite project size.

CAI: What are essential principles for solid project management?

HINDEL: We tend to plan projects based on the best case without considering worst case scenarios. More emphasis must be placed on risk management. I believe it was Tom DeMarco who said 'risk management is project management for adults,' and I agree. First, we need more iterative development cycles so we can practice new coefficients in projects. In addition, cycles must be planned and documented. Also, we must set up communication and escalation strategies for problem situations, in order to know who to inform and how to make changes efficiently if something goes wrong. This approach can speed up projects tremendously, save resources and help managers stay within budget.

CAI: What are some common mistakes organizations make after identifying project management shortcomings? Conversely, what are possibly less sophisticated, level-two organizations doing right?

HINDEL: Project management problems stem from insufficient planning. Projects are often initiated on unstable ground, using only rough estimates and rough requirements. Proper project management includes complete understanding of the desired outcome by all team members. Expectations must be double checked for correctness, and it must be determined whether sufficient resources to complete the project are available.

I think it was Mr. Weinberg who once provided us with a good analogy: During the Gold Rush out of Hudson Bay, some prospectors bought provisions and left to look for their claims in the wilderness of Alaska the same day. Others camped outside town to make sure that they had everything they needed to succeed. The prospectors who left the same day never came back. We should learn from this example when approaching project management.

CAI: We often see "ad hoc" management, in which projects are managed with little or no real data or metrics. Is this a core problem with project management? What do you see as a solution?

HINDEL: Many companies try to measure a lot of things about project management. The key is to measure the right things. You have to go back to a methodology called the Goal Question Metric methodology. Using this approach, a goal is set for improvement, and then metrics are derived. This approach helps assure you are measuring the right things. Many companies spend too little time thinking about what to measure and what to improve.

CAI: When we look at measurement or process improvement, we keep coming back to the relationship of metrics to processes. From a process perspective, what must a world-class, mature software development organization have in place to derive significant benefit from a project management improvement program or metrics program? When using measurement and metrics to improve project management, what should be tracked and what is the importance of measurement?

HINDEL: When dealing with metrics you must learn as you progress. There is a definite learning curve. Before defining metrics to improve processes, you must know how metrics can affect processes. In a model like SPICE, it's implicitly defined when you should start with metrics. The idea is if you have someone on a level 1 who can intuitively follow a process, then on level 2 you should have a measurement that will allow you to arrive at improvements. At that level, we only talk about project

measurements and project metrics that help you improve the project that's running. Level 3 involves measurements and metrics about processes. That means you should derive measurements and metrics that will lead to improvement for the entire organization. But to come up with those metrics you need to have progressed through the learning curve on level 2. At level 4 you learn about the boundaries when you are still progressing, when you have to react and so on. These maturity models are built on the idea of improvement by measurement. It's the same with CMMI.

CMMI and SPICE philosophies are very close, and I don't think this is clearly communicated. Unfortunately, many users strive for appropriate project outcomes without having an understanding of the core idea of these maturity models.

CAI: Please define SPICE's importance, characterizing the model's primary goals and your own focus area.

HINDEL: SPICE is very similar to CMMI in one respect: it is a maturity model for software development projects and processes. The original purpose for CMMI was concrete: it told you how to define the maturity of an organization and how to perform assessments on development processes in software engineering and systems engineering. Since the original idea from Humphrey and the Software Engineering Institute, however, SPICE has become more than that. It is now a building system for assessing processes that is not limited to software development. In this respect SPICE goes further than CMMI. SPICE is usually compared to CMMI using ISO 15504-5, which is an excellent model of how to use assessments for software process improvement.

As an ISO standard, SPICE only defines how we judge during an assessment, leaving it up to the user to determine the contents of these processes and what processes are assessed. SPICE allows users to enter any knowledge domain of any process area, and SPICE tells you how to do the assessment and how improvement can be measured in this process domain. We can use SPICE for the area of systems engineering, but also for any kind of engineering domain. For instance, SPICE would be an excellent model to help determine the best computing environment for banks. In fact, I believe the finance sector will be the next area where SPICE has a good chance to thrive

worldwide. It shares many properties with the automotive industry in that software is a mission critical item. There already exist several standards like ITIL, which can be incorporated into the SPICE model. There are activities to re-write ITIL so it can be used in a SPICE assessment. An advantage of the new SPICE model is that a bank or insurance company will be able to check ITIL and software development with one assessment.

The problem with CMMI is that it is not yet domain oriented. SPICE is a building system where domain-oriented applications are allowed to define themselves. Industries must be allowed to become familiar with SPICE to build acceptance, however.

CAI: How much penetration does SPICE have in our industry? How accepted it is internationally?

HINDEL: SPICE has a very high penetration on a worldwide basis in the automotive industry. I would say that about 70 to 80 percent of the automotive projects nowadays are measuring themselves compliant to SPICE. Because SPICE is a building system, the automotive industry was able to define its process assessment model in the SPICE framework. This method was used from 2004 to 2006. Now, the automotive SPICE is used widely, so we have a lot of SPICE assessments in Japan, China, all over Europe, in Australia and also in the United States.

CAI: Are there any other comments you'd like to make?

HINDEL: One thing I pushed in the past was creation of a unique worldwide education standard for SPICE assessors. As we learned from the Software Engineering Institute, even if a standard is published, it's not successful until you have people who know how to apply it. A maturity model is only successful if its level measurements or assessments are reproducible. We will only have reproducible assessment results if all the assessors have the same training and education so they have the same interpretation of the standards.

More than education, however, SPICE is about experience exchange. Such exchange is

mandatory for SPICE assessors, who must report joining experince exchange meetings quarterly to discuss different aspects of the assessments and interpretation of the standard. I don't believe experinc exchange is mandatory in CMMI appraiser training. There must be something in addition to simply writing the standard down on paper to make it worthwhile for the entire community.

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