Software Measurement Services Ltd

Risk and the CMMI®

Written by

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In early 2002 Donald Rumsfeld coined his now famous line about "known knowns", "known unknowns" and "unknown unknowns". As a long-time project manager this made quite a lot of sense to me, and I actually felt Mr R. was given an unwarranted hard time by the press over his remarks.

In terms of planning and managing projects, all too often only the "known knowns" are looked after, and sometimes not even all of these are covered. By "known knowns", I mean the normal activities and work products needed to deliver the expected output of the project, along with the various overheads that are usually necessary. It is the "overheads" that are sometimes missed (accidentally or intentionally); for example, the tasks to be done and work products to be produced to help manage the project itself. Therein lies another topic entirely!

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A typical CMMI® Maturity Level 1 organisation probably won't plan for all the "known knowns", let alone investigate what problems may or may not arise in the future (risks). It will simply ignore the metaphorical bullets and trust to luck that none of them will hit. Sometimes, such organisations do get lucky and are successful…for a while.

The Project Planning (PP) and Project Monitoring and Control (PMC) process areas of CMMI® describe the practices of identification, analysis and monitoring of risks for Maturity Level 2. However, at this level, although CMMI® provides some guidance as to what to do, the risk identification activity may be little more than a couple of brainstorming sessions to catalogue, understand and document the most obvious potential problems. To paraphrase Mr. R. again, these are the "known unknowns", i.e. potential problems that can be easily anticipated, but without any real understanding of whether or not they will come to pass. At ML2 risks might be analysed, but probably in a subjective and undocumented way (e.g. "wow…that's a big risk - maybe we should do something about it"). There are also likely to be regular reviews to check if the identified risks have occurred, but little thought is likely to be given to mitigation or avoidance strategies.

The science of risk analysis and management addresses project risk systematically and thoroughly.

That brings us to the "unknown unknowns". Surprisingly, there need not be as many of these as most people imagine if project risk has been addressed systematically and thoroughly. You could say that the science (yes, science!) of risk analysis and management deals with "unknown unknowns" by systematically rooting them out, recording their attributes and characteristics as far as possible, and even putting in place a set of potential solutions for different circumstances.

At Maturity Level 3, CMMI® provides a process area specifically dedicated to Risk Management (RSKM), which imposes a higher level of expectation on the organisation. At this level risk identification isn't an ad-hoc, informal process. Now the organisation is expected to pro-actively identify the sources of risk (e.g. uncertain requirements, new technology, inadequate sub-contractor competence – the CMMI® book provides a number of examples). The sources of risk are documented, made available to others in the organisation, and built on over a period of time as previously "unknown unknowns" show themselves, along with their sources.

Identified risks are sorted into categories, according to their nature rather than their source, to help understand how the risks might be dealt with. Each risk will be ranked and analysed according to pre-determined criteria (e.g. likelihood, probability of occurrence, etc.), and thresholds will be set to determine the course of action necessary for each level of risk. Some categories of risk may carry more weight than others, so thresholds and corresponding courses of action may vary from category to category.

The necessary courses of action may range from "do nothing" for risks which can be tolerated if they occur, through advance planning of action for risks which must be dealt with if they occur, up to taking preventative or mitigation action for risks that must not be allowed to occur.

Eventually, a better all round understanding of the risks leads to confidence that there are few, if any, "unknown unknowns".

Over a period of time the sources, categories, parameters, thresholds, mitigation strategies etc, all develop, resulting in a better all round understanding of the risks faced by the organisation. Eventually this leads to a situation where we can be confident that there are few, if any, "unknown unknowns", just a list of predictable, but not necessarily inevitable problems, and a knowledge of how to deal with them as and when they arise.

Now where did I put Mr Rumsfeld's address?

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Author Biography

Roger Gamage is an SEI authorised CMMI® instructor. He also provides training, mentoring and consultancy in more general project management and process improvement.

Following over 30 years experience as a technical manager in the communications and systems industries, Roger was introduced to the CMMI® early in the new millennium. It immediately struck a chord as the embodiment of many of the practical management practices that he had striven to foster during his varied career. He has rapidly progressed through the various levels of CMMI® training and is now an SEI authorised "Introduction to CMMI® " Instructor, and is working towards Lead Appraiser status.

Roger offers SEI Authorised CMMI® public training through his own company, Corner Process Improvement Solutions (www.cpisltd.co.uk), and is an SMS Principal Consultant.

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