



SMS Exemplar Group

Case Study

Delivering a Return On Investment In A CMMI[®] Improvement Programme



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The Question

If you are investing to improve your software development and support processes, how can you tell that your investment is being well spent?

This was the question posed by the managing director of a Belfast-based software development business, part of a major international insurance provider. Their IT team develops software for a variety of applications, working partly on its own and partly in conjunction with the parent company in the United States. Some work is outsourced to a software house in India, primarily code and unit testing.

The Plan

The group recruited a dedicated Process Improvement Manager and instituted an improvement programme based on the CMMI.

The Capability Maturity Model (CMMI)[®] provides a standard to which an organisation can compare its practices. It is based on the concept that in order to improve, it is necessary to progress through:

- Maturity Level One – Chaos
- Maturity Level Two – Stabilize the process
- Maturity Level Three – Understand the steps of the process and make them visible
- Maturity Level Four – Measure performance of the process and base decisions on that feedback
- Maturity Level Five – Innovate to continuously improve

With the Capability Maturity Model, performance can be accurately measured and compared over selected process areas, giving management the information needed to make key decisions regarding future investment and targets.

The immediate challenge was to stabilise the projects and to achieve Maturity Level 2. Like so many companies, however, delivery of products to customers had to take priority.

The company made the decision to concentrate attention on the areas that would give the greatest return.

Three target areas were identified as the immediate priorities; project and risk management, requirements development, and configuration management. Project teams also recognised that implementing a disciplined review process would reduce defects and the associated re-work, resulting in a lot less frustration. It was decided therefore to add a disciplined review process as a fourth area for phase one of the improvement plan.

Money, time and effort spent on improving processes must be demonstrably worthwhile - after 12 months of work, the management needed to know exactly how much progress had been made and where to focus next. SMS was commissioned to perform an independent external assessment comparing the local practices against the CMMI.

Why Choose SMS?

In this case, the company already knew and trusted SMS as a knowledgeable and objective provider. SMS was able to respond quickly and provide a suitable procedure within the company's budget.

With over a decade of experience, SMS has established a worldwide reputation for excellence and for maintaining an enviable relationship with clients.

The Answer

SMS proposed using a Minimal Evaluation Process to provide the company with the information it needed. This minimises cost, in terms of direct expense, impact on the staff and on current delivery commitments.

Following one day's off-site preparation, looking at examples of the company's typical work products, templates, and standard processes, the SMS consultant spent five days in Belfast with the IT team. Formal interviews were held with 27 people, amounting to about 20% of the software development workforce.

During the interviews the independent test group was identified as a critical omission from the planned schedule. The Process Improvement Manager was able to schedule additional interviews to cover this important area.

At the end of each interview, each person was asked to name the one thing they would like to change. SMS has found this exercise extremely useful and the "wish list" (anonymous, of course) was evaluated and included in the final report, providing senior management with significant insight into the key concerns of their staff.

SMS completed the appraisal on time and in budget. The findings were set against the tried and tested CMMI goals coverage checklist and a detailed report given to the operational managers. Subsequent presentations of the findings were made to the Managing Director and other managers.

The appraisal showed clearly that the company's investment had institutionalised improved practices in the areas addressed. It had good implementation of technical reviews, by some measures rated in the best 20% of practice.



The benefits of Minimal Evaluation include:

- the rapidity with which it can be planned and scheduled
- its short duration
- its low cost.

It highlights high-priority improvement opportunities and potential quick-wins whilst maintaining the rigour of the CMMI.

And the answer to the company's original question?

Yes, its investment had been money well spent. Results suggested even better returns would be derived from further attention to process improvement.

Next Steps

As a direct result of the Minimal Evaluation, the company established new targets for performance. It doubled the size of its process improvement team, convinced that investment in this area is richly rewarded.

A Schedule of appraisals and interim evaluations continue to evaluate progress, enabling the management team to further define and prioritise areas for improvement.

Improving processes as an enabler of business growth

The above evaluation was conducted by SMS in 2002. In 2007, Gordon Currie of Liberty IT and Grant Rule of SMS delivered a joint presentation to the European Software Engineering Process Group Conference on the 4-year CMMI journey at Liberty IT from 2002 to 2006.

The inner logic of CMMI maturity levels 2/3 is the need to detect defects early and prevent them. Based on industry standard costs, LIT saved more than \$8 million in wasted effort over this 4 year period as a result of defects found/fixed before testing.

This in turn resulted in increasing productivity & capacity and continuously improving quality. More defects were being caught earlier in the lifecycle, and fewer defects released into production, with the result that better value was delivered to the business.

Achieving this CMMI level 2/3 goal has the following impacts:

Project/Development Impact

- Effective and efficient processes
- Productive workforce
- Minimal re-work

Product Impact

- Reduced time to market/More functionality
- Fewer defects shipped

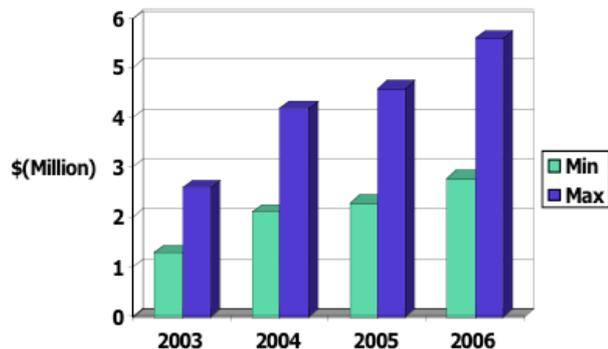
Business Impact

- Superior product
- Competitive edge

IT Customer Impact

Delighted customers

Technical Review savings



Base Statistics : Marilyn Bush Associates

- 1 defect found early in development costs \$100 to fix
- 1 defect found during testing costs \$1000 to \$2000 to fix
- 1 defect found during operations costs \$10,000 to \$20,000 to fix

LIT's Journey

In 2005, LIT were looking at continued growth supported by a process focus. By 2006, the priority was clearly to improve delivery through quality. LIT considered quality would become an increasingly important differentiator in the future, quoting a Gartner report, ITXPO – Quest for Quality : October 2006. “The Quality Gap is Widening”. This report, published before the need for effective and sustainable performance improvement was underlined by the world-wide impact of the ‘credit crunch’, made the following predictions:

‘By 2009, 90% of top-tier internal and external service providers will be distinguished by their substantial process capabilities as well as their quality and service improvement capabilities (0.8 probability)

By 2011, IT organisations that have not built holistic, integrated quality management programs and values will be substantially underperforming against industry norms (0.8 probability)

Through 2011, quality problems in 75% of the IT organisations will be predominantly defects and waste caused by silo based sub-optimization (0.8 probability)

Through 2009, 75% of IT organisations will focus their “quality” initiatives too narrowly on implementing ITIL, CMMi, Prince or PMI’s PMBOK (0.9 probability)

Through 2009, two-thirds of IT organisations will overemphasize process at the expense of developing staff and the appropriate values and behaviours (0.8 probability)

By 2016 many organisations that have not deployed quality techniques successfully will fail, be absorbed or be outsourced to those who have.’

Gartner ITXPO – Quest for Quality : October 2006.
“The Quality Gap is Widening”

The best companies in the world put quality first. Toyota are up to twice as fast getting products to market as their competitors. They have never missed a launch date, nor do they miss interim milestones. They consistently have the best quality in the industry.

It is worth noting that Toyota adopted the principles of value-focused, Lean workflow in response to the austere financial climate in Japan following the end of WW2. Properly applied, it is a resilient approach that enables an organisation to function effectively and sustain growth both in prosperous and in more challenging economic times.

The economic crisis of recent years has led to many organisations reducing or abandoning improvement programmes rather than stimulating a greater focus on improved quality and business results. This suggests that despite the change of economic circumstances between 2006 and today, Gartner’s predictions for 2016 remain more than ever valid. Developing staff capability is crucial to the sustainability of today’s software-intensive business systems, and the support of experienced specialist practitioners is critical.

Improved Delivery through Quality

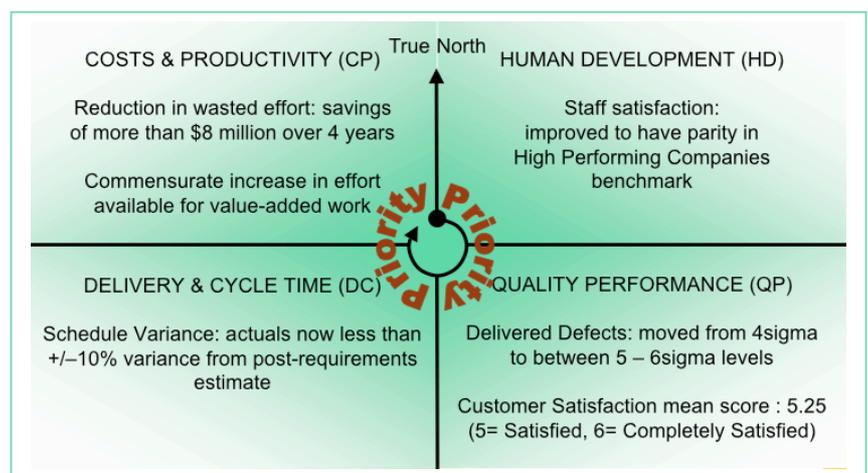
LIT aimed to sustain the improvement in quality through (1) project stability; (2) product quality; (3) human development & learning. They recognised a need to transition from ‘faster, cheaper, BETTER’ to ‘BETTER, faster, cheaper’ and develop a real emphasis on quality – not just deadlines and cost.

The importance of requirements quality was a clear driver for sustainable improvement in quality. Tests are only as good as the requirements they are testing. If requirements are ambiguous, tests will not be effective. Quality cannot be tested into a system, a system must be designed for quality from the outset, with management controls in place to ensure the right behaviours are incentivised at all stages of the end-to-end process.

Quality & Delivery are both important and can complement each other. The key identified by LIT was to reward the desired behaviour rather than ‘talk quality’ but only ‘reward delivery’. The biggest factor in striving for excellence is your PEOPLE, and deploying ‘True North’ metrics encourages engagement.

The True North scorecard puts Human Development as the No. 1 priority, followed by Quality, followed by Delivery & Cycle Time, followed by Costs & Productivity.

LIT’s ‘True North’ Scorecard



Focusing on human development pulls through improvements in the other three areas.

Conclusion: has it been worth it?

LIT has grown from 28 to over 225 staff in 10 years. Using Lean principles coupled with a CMMI-based programme has enabled it to simultaneously:

- Improve employee morale
- Increase customer satisfaction
- Improve product quality to 5-6 sigma levels
- Broaden the customer base
- Engage more closely with end-users
- Deliver faster and more predictably
- Remove waste to increase productivity

It is questionable whether the results achieved could have been delivered by any other means.

