SSQC's Software Process Improvement Services Profile

Software Systems Quality Consulting (SSQC) and its consulting partners have resources focused on Software Process Improvement based on models such as the Software Engineering Institute's Capability Maturity Model for Software (CMM) and ISO 9001 and TickIT. All of our consultants have extensive experience in a variety of software and systems engineering disciplines.

SSQC is the *recognized leader* in assisting companies that are moving beyond ISO 9001/TickIT implementations to address the more extensive and detailed practices defined in the CMM. SSQC has developed a hybrid assessment method, HM^2, that is useful for companies transitioning from one model to the other – and for companies considering adopting both models to ensure that process improvement is coordinated in all parts of the company .

SSQC is a leader in the field of Software Process Improvement (SPI) and has experience providing assessments, training, and SPI consulting to both commercial and government clients. SSQC has performed more than 100 appraisals using a variety of models and methods (CMM SCEs, CMM CBA IPIs, CMM mini-assessments, ISO 9001 and TickIT registration audits, internal audits, ISO 9001-based supplier audits, and audits performed following SSQC's own Hybrid Multi-Model Method - HM^2 for the CMM and ISO 9001). SSQC has had a wide range of SPI consulting engagements in Fortune 500 companies and government agencies.

SSQC is an active United States TAG member in the ISO/IEC JTC1 SC7 - Software Engineering Standards subcommittee which is responsible for the development and maintenance of ISO 12207 and ISO 15504 (SPICE).

- Additional information about our services can be obtained at our website:
  http://www.ssqc.com

- SSQC also has a brochure on our website that outlines our services and education programs, including our full line of CMM training:
  http://www.ssqc.com/broc17.pdf

- A presentation is also available that outlines SSQC's industry experience, including industries served, clients served, consulting services provided, assessment services, training services, SSQC's strategic relationships, and SSQC's professional associations:
  http://www.ssqc.com/ssqcpres.pdf

- Additional copies of this software process improvement profile can be obtained at:
  http://www.ssqc.com/ssqcexp.pdf

EXPERIENCE IN CMM-BASED SOFTWARE PROCESS IMPROVEMENT

This paper focuses on the experience of SSQC and its consulting partners in providing CMM-based software process improvement services. SSQC has extensive experience in all facets of software process improvement, including:

- Providing training and workshops on the CMM, on the CBA IPI methodology, on the Software Capability Evaluation (SCE) methodology, and on specific Key Process Areas (KPAs)

- Facilitating workshops and building consensus among executive, middle, and first-line managers and technical staff for software process improvement initiatives

- Designing processes and procedures, and assisting in their development, piloting and implementation

- Baselining an organization's software development and project management processes and performing interim appraisals to measure improvement

- Assisting in the development of a software process improvement infrastructure within an organization

- Providing assistance to senior management in introducing new technologies into the organization

- Supporting Software Engineering Process Groups in coordinating the efforts of Process Action Teams and in developing tailored solutions to process weaknesses.

SSQC has in-depth experience in assisting corporations improve their software engineering and management practices, using both the Software CMM (SW-CMM) and ISO 9001/9000-3/TickIT.

SSQC'S BROAD RANGE OF EXPERIENCE WITH THE CMM

SSQC's extensive success with the CMM is the result of several factors:

- The training of our consultants in the CMM

- Our work with the SEI to institutionalize the CMM throughout industry

- Our experience with a variety of organizations, including commercial companies in the "Silicon Valley", to elevate the overall maturity level of their software development practices.

SSQC is confident in its ability to provide consultants who can transfer this knowledge to clients who wish to achieve not only a CMM Level rating, but also bottom line business benefit in return

for their investment in software process improvement. The following paragraphs describe in more detail our staff training, our work with the SEI, and our successes in software process improvement based on the CMM .

CONSULTANT TRAINING IN CMM

Our consultants are well versed in all aspects of the CMM. As part of our technical staff's continuing education, SSQC and its consulting partners provide training and workshops for all new staff in the CMM, appraisal methods, and KPA subject matter. Based upon our work with the SEI, as well as performing assessment and providing software process improvement support to numerous clients, we have been able to obtain a thorough understanding of the intent of the KPAs, as well as the best practices of successful software development organizations – in both government-systems providers and in commercial organizations providing off-the-shelf software in a number of markets.

Our workshops and training leverage our experience in software process consulting to build a thorough understanding of the KPAs, their interrelationships, and their practical application in a variety of development environments. Because our courses and workshops are designed to be tailored for each organization (small and large), we are able to impart detailed insights and knowledge in how to implement the processes and procedures required by the CMM in a way that supports the strengths of the organization.

RELATIONSHIP WITH THE SEI

Since 1993, when SSQC received permission from the SEI to reproduce various SEI CMM 1.1 technical reports for resale to the public, SSQC has maintained a close relationship with the SEI.

Since 1996, SSQC has offered a variety of presentations and tutorials at the annual SEI-sponsored conferences (SEPG) and symposia in both the US and Europe (ESEPG).

SSQC was also presented an award by the SEI for outstanding service on the conference committee for SEPG 97 in San Jose, California.

SSQC has presented numerous tutorials and presentations (including the development of and transition to CMMI) at local SPINs in the Silicon Valley and has promoted a variety of SEIs offerings.

Since early 1999, SSQC tutorials, presentations, and panels have been successfully promoting the CMMI transition efforts (both staged and continuous models) at a variety of conferences to include ESEPG 1999/2000, SEPG 1999/2000, Quality Week 1999/2000, PNSQC (1999/2000).

Since June 2000, SSQC has been successfully promoting the CMMI transition efforts (both staged and continous models) in the week long CMM series being offered by UC Santa Cruz's software engineering program.

SSQC's CMM CONSULTING WITH VARIOUS ORGANIZATIONS

Since 1993, SSQC has provided practical software process improvement support using the CMM's Key Process Areas as the focus of our improvement recommendations. Our experience in working with each of the KPAs has provided us with intimate knowledge of what works, what doesn't work, and how best practices associated with the KPAs can be quickly implemented. A representative sample of our software process improvement projects includes:

- **Chinese Certification Center for Quality System of Electronics (CCQE):** SSQC was invited, on behalf of CCQE and the People's Republic of China's Ministry of Information Industry, to act as visiting scholars and perform training on models for quality such as the CMM and ISO 9001/9000-3. SSQC's training classes were attended by over 100 professionals from a variety of information techology firms throughout China.

- **Alltel Information Services:** SSQC is assisting Alltel Information Services with it's company-wide software process improvement efforts based on ISO 9001 and Level 2 and 3 KPAs of the CMM. Alltel Information Services is a leading provider of core processing services, software, and systems integration services for financial institutions around the globe. SSQC has provided CMM and ISO training for the software process improvement and internal assessment teams. SSQC has performed an HM2 assessment to support Alltel's adoption of the ISO 9001 and CMM models. SSQC continues to work with the software process improvement team in defining practices and procedures that embrace both CMM Level 2 and 3 KPAs as well as ISO 9001.

- **KLA-Tencor:** SSQC is assisting KLA-Tencor Corporation with it's company-wide software process improvement efforts based on Level 2 and 3 KPAs of the CMM. KLA-Tencor Corporation is the world's leading supplier of process control and yield management solutions for the semiconductor and related microelectronics industries. SSQC has provided CMM training, KPA workshops, CBA IPI and mini assessments, implementation planning, and process and procedure development in divisions throughout the company. KLA-Tencor is the first semiconductor equipment manufacturer to achieve CMM Level 2 in one of its product divisions.

- **United Defense Combat Vehicle Systems (UDLP):** In 1996 SSQC provided consulting services that led to UDLP being assessed at Level 2 compliance in 1997 and with Level 3 compliance in 1998. United Defense provides the military with various products for combat capability. They focus on serving eight major markets: Naval Gun Systems, Launching Systems, Combat Vehicle Systems, Field Artillery Systems, Combat Support Vehicle Systems, Automated Munitions Handling Systems, Amphibious Assault Vehicles, and Support Services. SSQC provided numerous baseline assessments and focused process improvement consulting for Level 2 and 3 KPAs. SSQC worked directly the SEPG group at UDLP in defining processes and procedures to institute Level 2 and 3 KPAs and helped position them for Level 4.

- **Boeing Corporation:** SSQC, under contract to, and along with Abacus Technology, is assisting the F/A-18 Avionics Software program in its software process improvement efforts. The team recently performed an SCE to measure progress in achieving Level 4. Using the SCE findings as a baseline, we assisted them in focusing on needed improvements. A key component of our support is in reviewing the status of their efforts to improve in specific Key Process Areas. The joint SSQC/Abacus consulting team provided a Lead Evaluator to assist the SEPG in doing interim appraisals on specific KPAs across the organization.

BREADTH OF SERVICES FOR CMM-BASED SPI

SSQC has been providing software process improvement consulting to a number of clients in the fast-paced commercial software sector including ***KLA-Tencor, The BaaN Company, Alltel, Barra Corporation, Novellus, DSET, and VISA***. See our clients served list at the end of the profile. To improve these organizations' engineering capabilities, SSQC is providing a full complement of software process improvement consulting services, which includes:

- Baseline and interim appraisals
- CMM, CBA IPI team, and KPA training and workshops
- Software process improvement consulting services

Each service is discussed below with emphasis on our "hands-on" experience in facilitating our clients' progress in timely and successful development and implementation of CMM-based software development practices.

BASELINE AND INTERIM APPRAISALS

As part of our consulting practice, SSQC performs a variety of types of appraisals to help the client effectively integrate tools, methods, and practices to improve the quality and productivity of their software management. Our CMM based appraisals range from CMM mini-assessments to more formal Software Capability Evaluations (SCEs) and CMM Based Appraisals for Internal Process Improvement (CBA IPI). We have assisted organizations in identifying risks inherent in their software development processes, and have measured an organization's progress and commitment to improving their software development capabilities.

CMM TRAINING AND WORKSHOPS

The foundation of our services is the education that we provide to our clients. SSQC offers 29 separate courses that support engineering and process improvement. SSQC conducts CMM training classes publicly, as well as on-site for our clients. In addition, we conduct tailored 1, 2, or 3 day workshops on Level 2 and Level 3 KPAs. Our instructors for CMM training and KPA workshops are highly experienced software professionals with extensive software engineering experience in the topic they are instructing. To maximize retention, our courses incorporate extensive, world-class, technology-based visual aids and class handouts. The goal of all SSQC training is to prepare participants to use their newly acquired skills and knowledge to achieve practical software process improvement.

SSQC has partnered with universities such as UC Berkeley's Nationwide Training Program, UC Santa Cruz's Software Engineering Department, and Cal State University, Long Beach's Software Engineering Forum for Training, in offering CMM training for a variety of companies throughout the world.

UC Santa Cruz Extension's comprehensive 5-day CMM series is taught exclusively by SSQC's SPI professionals.

SSQC has also provided CMM and software engineering training for industry and conference groups such as the American Software for Quality's Software Division, IEEE Software Engineering Standards Symposium (ISESS), Semiconductor and Materials International (SEMI), the American Electronics Association (AEA), Pacific Northwest Software Quality Conference (PNSQC), Software Research Inc.'s Quality Week, Software Technology Conference (STC), and the Software Engineering Institute (ESEPG, SEPG).

SOFTWARE PROCESS IMPROVEMENT (SPI) CONSULTING SERVICES

These services are aimed at developing software engineering practices that have a positive return on investment - that help client organizations deliver products to market faster and with quality that satisfies customers' needs. SSQC takes into consideration the size of organization (small to large) as well as the industry sector (commercial-off-the-shelf to contract development) and tailors it's services to address specific client needs. The objectives of our SPI consulting services are to:

- Review current software management and software development practices and identify weaknesses or deficiencies that can be improved by the CMM

- Identify the roles and responsibilities of all parties involved in software management and ensure that the responsibilities are fully and clearly documented

- Evaluate the tools and methods being used for project management and the documentation that supports their use

- Ensure that the skills and training of those individuals in the project management process are sufficient and that plans are in place to maintain staff effectiveness

- Assist in the establishment of a common repository in which data from all projects can be stored and retrieved

- Define software engineering practices and develop supporting procedures

- Define useful software metrics and develop supporting procedures by which metrics can be analyzed to assist in process improvement

- Assist management and the SEPG in the implementation of process improvements and in the management of change throughout the organization

- Assist key technical staff in rapidly gaining technical proficiency in software engineering practices so that they can both develop improved processes and procedures, and train their peers in the adoption and use of software process improvement concepts and principles.

SSQC CONNECTIONS

Partial List of Companies Served by SSQC

ABB	CONSILIUM	Loral	Raychem
Actel	CORNERSTONE IMAGING	McDonnell-Douglas	Rolm
ACUSON	CTB McGraw-Hill	MDL Info Systems	SCHULZE MFG.
ADOBE	Digital Microwave	Mentor Graphics	SMOS
Advantest	EDS	MKS	Sun Microsystems
Alltel	ETAK	Motorola	SunSoft
Amdahl	Fujitsu	NASA-Ames	Synopsis
Antaries Alliance	Gallo Winery	National Semiconductor	Synoptics
Apple Computer	GUPTA	Netframe Systems	U.S. Air Force
Applied Materials	Hewlett-Packard	Northern Telecom	U.S. Navy
Atria Software	Hitachi Data Systems	Novell	TCI Communications
Auspex	Hitachi Micro	Novellus	Texas Instruments
Autodesk	ICL	Objectivity Inc.	TRW
Barra Inc.	ICOT	Octel	United Defense
Becton Dickinson	Informix	Oracle Corporation	Varian
Cadence	Kaiser	Pacific Bell	Viewlogic
Centigram	KLA-Tencor	Philips Semiconductor	Western Digital
Cisco	Lam Research	Plexus Software	Wind River Systems
CLARIFY	Lockheed-Martin	Pyramid	Xilinx

Partial List of Professional Associations Served by SSQC
- American Electronics Association (AEA)
- American Society for Quality Control (ASQC) - Local and National Chapters
- ANSI/RAB Software Quality System Registration Committee (SQSR)
- ISO/IEC JTC 1/SC7 Software Engineering Standards - United States TAG
- National Association of Purchasing Management (NAPM)
- Semiconductor Equipment and Materials International (SEMI)
- Software Publisher's Association (SPA)
- Software Engineering Forum for Training, California State University, Long Beach
- University of California, Berkeley
- University of California, Santa Cruz

Partial list of International Conferences/Seminars with papers and/or tutorials presented by SSQC
- ASQ Annual Quality Congress (1994, 1997, 1999)
- ASQ 5 th/6 th/7th/10 th Annual Quality Audit Conference (1995, 1996, 1997, 2000)
- CEEM's Implementing ISO 9000 in the Software Industry (1994)
- First World Congress for Software Quality (ASQC Software Division 1995)
- International Conference on S/W Quality (ASQ Software Division 1994-95, 1997-1999)
- Pacific Northwest Software Quality Conference (1998, 1999, 2000)
- Software Publisher's Association Conference (SPA 1994)
- Software Quality Week (Software Research Inc., San Francisco, 1994-97, 1999, 2000)
- Software Engineering Institute's SEPG Conference (SEI 1996, 1997, 1998, 1999, 2000)
- Software Engineering Institute's European SEPG Conference (SEI 1999, 2000)
- STC-Software Technology Conference (DOD 1996, 1998, 1999, 2000)

Partial list of Periodicals who have published Papers/Articles provided by SSQC
- Compliance Engineering
- CrossTALK - The Journal of Defense Software Engineering
- IEEE COMPUTER
- INFO WORLD
- McGraw-Hill, ISO 9000 Handbook
- McGraw-Hill, Quality Systems Update
- Software Marketing Journal

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