

SELF-ASSESSMENT

FOR ISO-9000-3 AND THE SEI CAPABILITY MATURITY MODEL™

Software Development Quality Process

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Prepared For:
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Greetings!

Dear Software Colleagues,

We trust you will find this Self-Assessment informative and beneficial. *There are over 140 questions that will help you gauge your compliance with industry-wide guidelines.*

This Self-Assessment has been carefully researched and developed, based on the major industry guidelines ISO-9000-3 and the Software Engineering Institute Capability Maturity Model™. These two standards are similar in scope and deal with software development processes and project management.

Please note that “process improvement” is only one factor in the quality equation – you need personnel who “buy in” and are thus motivated!

ISO-9000 Series

ISO-9000-3 is typically considered an international standard for quality. It is the defining standard accepted by almost all European and North American countries. Software development companies are often required to conform to ISO standards in order to be considered for contract awards. ISO-9000-3 provides special guidelines for implementing ISO-9000, and was created specifically for the software development industry.

SEI Capability Maturity Model (CMM)

For many years, the SEI CMM™ has been the standard set of quality guidelines for companies developing software for the U.S. Government (usually the Department of Defense). Companies wishing to develop software under these standards are evaluated according to five capability levels, ranging from uncontrolled development processes to consistently effective organization-wide implementation. Each of these levels (except Level 1) has an associated set of “Key Practice Areas” (KPA) that focus on specific activities.

This Self-Assessment covers every paragraph and section of ISO-9000-3, with cross-references to all SEI CMM KPA's.

“The goal is to transform customer requirements into quality software products. The more efficiently this is done, the greater the employee’s and customer’s satisfaction, and the greater the profits.”

Gary M. Beckert,
Software Quality Instructor

Software Quality Self-Assessment

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p style="text-align: center;">About ISO-9000-3</p> <p>4. Quality System Requirements</p> <p>Section 4 of the ISO-9000-3 document identifies and defines 20 key areas of quality system requirements.</p> <p>These requirements are the basis for registration and certification audits.</p> <p>In the spaces below we've added useful information and comments along with the ISO paragraph references.</p>	<p style="text-align: center;">About the Capability Maturity Model</p> <p>The SEI CMM Defines five Maturity Levels, ranging from Level 1, Initial (ad hoc), to Level 5, Optimizing.</p> <p>Throughout the five levels, 18 Key Process Areas identify specific areas of focus.</p>	<p style="text-align: center;">About This Self-Assessment</p> <p>The following questions will give you an idea of how your quality process relates to guidelines identified by ISO-9000-3 and the Software Engineering Institute (SEI) Capability Maturity Model™ (CMM).</p> <p>These are relatively high level examples of questions you may receive during and audit. Actual audit questions are much more detailed. In an actual audit, you will need to provide the documents and metrics you use in your process, and it is common practice for auditors to interview team members who have been chosen randomly.</p> <p>We wish you success and continued prosperity. GM Beckert & Associates, Inc. First Release, September, 1998 Second Version, May, 2000</p>
<p>4.1 Management Responsibility</p> <p>It is not surprising management support is first on the list. Without adequate funding and real management "buy-in", you probably won't meet your goals.</p>	<ul style="list-style-type: none"> ▪ Organization Process Focus ▪ Quantitative Process Management ▪ Process Change Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Is your process improvement initiative funded? <input type="checkbox"/> Does the initiative relate to corporate goals and customer needs and expectations? <input type="checkbox"/> Do you have measurable objectives and milestones? <p>Comments: You should be able to answer "yes" to each of these questions before you commit resources.</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.1.1 Quality Policy</p> <p>Management must sponsor and support the Corporate Quality Policy.</p>	<ul style="list-style-type: none"> ▪ Software Quality Assurance 	<ul style="list-style-type: none"> <input type="checkbox"/> Is your quality policy documented? <input type="checkbox"/> If so, is the policy understood and implemented at all organizational levels? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.1.2 Organization</p> <p>Your quality organization must be defined and have organizational freedom to identify issues and authority to deal with them.</p>	<ul style="list-style-type: none"> ▪ Software Project Tracking and Oversight ▪ Software Quality Assurance 	<ul style="list-style-type: none"> <input type="checkbox"/> Are the roles, responsibilities, and authority of your quality organization documented? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.1.2.1 Responsibility and Authority</p> <p>Each team member must have documented responsibility <u>and</u> authority.</p>	<ul style="list-style-type: none"> ▪ Requirements Management ▪ Organization Process Focus 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have an identified quality assurance team? <input type="checkbox"/> Are their individual roles and authority documented? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.1.2.2 Resources Your required resources must be identified and available.</p>	<ul style="list-style-type: none"> ▪ Organization Process Definition 	<ul style="list-style-type: none"> <input type="checkbox"/> Have adequate software and hardware been identified and obtained? <input type="checkbox"/> Are personnel trained in their respective quality tasks? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.1.2.3 Management Representative Your executive must appoint a member of your management to ensure quality, and to report quality issues to executive management.</p>	<ul style="list-style-type: none"> ▪ Software Quality Assurance 	<ul style="list-style-type: none"> <input type="checkbox"/> Is there a defined person, appointed by executive management, responsible for implementing your quality program? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.1.3 Management Review Management must review the quality system at defined intervals and document the results.</p>	<ul style="list-style-type: none"> ▪ Software Quality Assurance 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a scheduled review cycle for management to evaluate your quality system? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.2 Quality System Your quality system (also called "quality process") must document quality procedures and how quality requirements will be met.</p>	<ul style="list-style-type: none"> ▪ Organization Process Definition ▪ Software Quality Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Is your quality system documented in logical and easy to use manuals? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.2.1 General Your quality manual can include quality procedures, or refer to other documents with the procedures.</p>	<ul style="list-style-type: none"> ▪ Organization Process Definition 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a Quality Assurance manual, or equivalent? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.2.2 Quality System Procedures Just documenting procedures is not enough; you must be implementing and maintaining them.</p>	<ul style="list-style-type: none"> ▪ Organization Process Definition 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have documented procedures? <input type="checkbox"/> Are they used? <input type="checkbox"/> Are they maintained? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.2.3 Quality Planning You need to document exactly how customer requirements will be met. Not having a plan is like not having a map – you could well get lost.</p>	<ul style="list-style-type: none"> ▪ Software Project Planning 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you prepare quality plans for your projects? <input type="checkbox"/> Do you identify resources and provide for acquisition? <input type="checkbox"/> Do you ensure overall process compatibility? <input type="checkbox"/> Do you stay up to date on new tools and techniques? <p>Comments: These are just a few of the related topics. ISO-9000-3 adds much more to ISO-9001:1994 about requirements and development phases. The CMM also stresses requirements, architectural design, life cycle models, and quality planning.</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

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<p>4.3 Contract Review Protect yourself by having documented procedures for contract reviews and amendments.</p>	<ul style="list-style-type: none"> ▪ Requirements Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a handle on your contract management? <input type="checkbox"/> Do you keep complete, searchable records? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.3.1 General Contract review applies to contracts, software embedded in your hardware, commercial products, and internal business processes.</p>	<ul style="list-style-type: none"> ▪ Requirements Management 	<p>For which of the following do you have written contract management procedures?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Development contracts <input type="checkbox"/> Embedded software <input type="checkbox"/> Commercial products <input type="checkbox"/> Internal business processes <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.3.2 Review It is important to carefully review contracts, orders, and requirements before tender submission.</p>	<ul style="list-style-type: none"> ▪ Requirements Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a documented procedure for reviewing contracts? <input type="checkbox"/> If so, is it followed? <p><i>Comments: ISO-9000-3 lists 28 concerns relating to customer, technical, management, and legal/security issues.</i></p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.3.3 Amendment to a Contract Amendments must be spelled out.</p>	<ul style="list-style-type: none"> ▪ Requirements Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a process to handle amendments? <input type="checkbox"/> If an amendment is made, will you know which of your organizational elements get involved and what their roles are? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.3.4 Records Obviously, keep fairly detailed and cross-referenced records. Use a standard numbering system.</p>	<ul style="list-style-type: none"> ▪ Requirements Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you keep complete, descriptive, and cross-referenced records? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4 Design Control Documented procedures are required to deal with requirements analysis, architectural design, planning, and software design/coding.</p>	<ul style="list-style-type: none"> ▪ Software Project Tracking and Oversight ▪ Software Product Engineering ▪ Integrated Software Management ▪ Quantitative Process Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have documented procedures? <input type="checkbox"/> Are they used? <input type="checkbox"/> Are they maintained? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.1 General This detailed paragraph discusses life cycle models, the development process, coding rules, and tools/techniques.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you use a documentation system that controls and verifies the design of the product? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

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<p>4.4.2 Design and Development Planning</p> <p>Each development activity must be planned. The section is detailed and lists 9 major categories.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a Software Development Plan? <input type="checkbox"/> If so, does it define how the project will be managed? <input type="checkbox"/> Does it identify and organize resources? <p><i>Comments: ISO-9000-3 goes on and on about this, with 31 subcategories, which you implement based on your unique circumstances.</i></p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.3 Organizational and Technical Interfaces</p> <p>Identify each group (including regulatory and government agencies) that has a part of the process, and document how they share information.</p>	<ul style="list-style-type: none"> ▪ Intergroup Coordination 	<ul style="list-style-type: none"> <input type="checkbox"/> Are the boundaries of responsibility for each party defined? <input type="checkbox"/> Do you schedule regular (or milestone based) project reviews? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.4 Design Input</p> <p>These relate to requirements, including regulatory or statutory. Requirements management may be the most crucial aspect of a given project.</p>	<ul style="list-style-type: none"> ▪ Requirements Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you use a formal software requirements document as a controlling factor? <input type="checkbox"/> Do you have a system to control requirements? <input type="checkbox"/> Can you show your customer how you view and define features or defects? <p><i>Comments: This factor may be the most important aspect of any contract. Ambiguous and incomplete requirements must be revised. You need a process that will let you negotiate fairly with your customer with regard to "defects" or "features".</i></p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.5 Design Output</p> <p>Your design outputs should be traceable to the requirements, including user guides and technical manuals.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Integrated Software Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Can you verify and validate your design outputs against the requirements? <p>Which of the following are your design outputs?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Architectural design/specification <input type="checkbox"/> Detailed design specification <input type="checkbox"/> Source code <input type="checkbox"/> User Documentation <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.6 Design Review</p> <p>Each project needs milestones for project reviews, appropriate for the complexity of the project.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Peer Reviews ▪ Integrated Software Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a consistent review process for all project types? <input type="checkbox"/> Do you have a documented design review procedure? <input type="checkbox"/> Do you have a process for resolving deficiencies? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

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<p>4.4.7 Design Verification Compare the design output with the input to make sure requirements are met.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Integrated Software Management 	<p><input type="checkbox"/> Do you use a formal verification process?</p> <p>If so, which (if any) method do you use to verify your design?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Design output functionality <input type="checkbox"/> Prototypes <input type="checkbox"/> Simulations <input type="checkbox"/> Tests <input type="checkbox"/> Other _____ <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.8 Design Validation You'll need to show how your software performs in meeting user needs and requirements.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Integrated Software Management 	<p><input type="checkbox"/> Do you use a formal design verification process?</p> <p><input type="checkbox"/> Do you record and check validation results against requirements?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.4.9 Design Changes It is vital to keep track of design modifications.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management ▪ Software Product Engineering 	<p><input type="checkbox"/> Do you have a configuration management system?</p> <p><input type="checkbox"/> Is it implemented consistently?</p> <p><input type="checkbox"/> Can you re-create old software versions easily?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.5 Document and Data Control Even the documents themselves need written procedures for their maintenance.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management ▪ Software Product Engineering 	<p><input type="checkbox"/> Do you have a system for maintaining paper-based documentation?</p> <p><input type="checkbox"/> Do you have a system for maintaining documentation and information stored on computer?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.5.1 General The guidelines suggest establishing a configuration management system for project data and documentation.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management 	<p><input type="checkbox"/> Do you have document control procedures for contracts and requirements documentation?</p> <p><input type="checkbox"/> Do you have procedures for maintaining your quality system documentation and data?</p> <p><input type="checkbox"/> Do you have procedures for maintaining your supplier management documentation?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.5.2 Document and Data Approval and Issue Authorized personnel should approve documents, and you should pay special attention to access, distribution, media, and archiving.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management 	<p><input type="checkbox"/> Do you track documentation changes to ensure only the pertinent issues are being used?</p> <p><input type="checkbox"/> Do you have a process to remove (or archive) obsolete documents and data?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.5.3 Document and Data Changes</p> <p>Documents should be reviewed/approved by the same organization that performed the original review and approval.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your document control system allow for the original reviewers/approvers to review and approve changes? <input type="checkbox"/> Does your document control system provide for descriptions of the nature of documentation changes? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.6 Purchasing</p> <p>Your documented purchasing procedures should ensure each purchased item (or subcontracted product) conforms to specifications.</p>	<ul style="list-style-type: none"> ▪ Software Subcontract Management ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a purchasing process that ensures expenditures are for the appropriate products/services and relates to your specifications? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.6.1 General</p> <p>Consider each purchase related to developing, supplying, installing, and maintaining your software product.</p>	<ul style="list-style-type: none"> ▪ Software Subcontract Management ▪ Software Product Engineering 	<p>For which of the following do you have purchasing procedures?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Commercial off the shelf software <input type="checkbox"/> Subcontractor development <input type="checkbox"/> Computer hardware <input type="checkbox"/> Software development tools <input type="checkbox"/> Contract staff <input type="checkbox"/> Maintenance and customer support services <input type="checkbox"/> Training courses and materials <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.6.2 Evaluation of Subcontractors</p> <p>Besides determining if the subcontractor can do the job, define the level of control you must provide, and keep records relating to qualified subcontractors.</p>	<ul style="list-style-type: none"> ▪ Software Subcontract Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a documented process for evaluating subcontractor capabilities? <input type="checkbox"/> Does your process define the level of control you will have over the subcontractor? <input type="checkbox"/> Do you maintain records of subcontractors and their performance/capability? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.6.3 Purchasing Data</p> <p>Your purchasing documents need to contain detailed data on the product or service purchased.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your purchasing documentation clearly describe the product or service ordered? <input type="checkbox"/> Do you review and approve purchasing documents for adequacy prior to release? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.6.4 Verification of Purchased Product</p> <p>You and your end customer (if applicable) must verify the purchased product.</p>	<ul style="list-style-type: none"> ▪ Intergroup Coordination ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your process provide for verification at the subcontractor's location? <input type="checkbox"/> Do you have a procedure for end-customer verification of subcontracted products? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.6.4.1 Supplier Verification at Subcontractor's Premises</p> <p>You specify the verification procedure and product release method.</p>	<ul style="list-style-type: none"> ▪ Intergroup Coordination ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you specify the verification procedure when verifying product at the subcontractor's site? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.6.4.2 Customer Verification of Subcontracted Product</p> <p>You should provide for your end customer to verify subcontractor's product where specified in the contract.</p>	<ul style="list-style-type: none"> ▪ Intergroup Coordination ▪ Software Product Engineering 	<p><input type="checkbox"/> Do you provide for customer verification at subcontractor sites?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.7 Control of Customer Supplied Product</p> <p>Customer supplied products and data must be managed.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management ▪ Intergroup Coordination 	<p><input type="checkbox"/> Do you have documented procedures for controlling verification, storage, and maintenance of customer supplied data and products?</p> <p><input type="checkbox"/> Do you document and report lost, damaged, or unsuitable customer supplied products and data?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.8 Product Identification and Traceability</p> <p>Your product must be traceable from receipt through all stages of production, delivery, and installation.</p>	<ul style="list-style-type: none"> ▪ Software Configuration Management 	<p><input type="checkbox"/> Do you have a documented configuration management process?</p> <p><input type="checkbox"/> If so, is it consistently used?</p> <p>Comments: ISO-9000-3 expands significantly on ISO-9000 in this area, emphasizing the configuration management system, configuration elements of the product, related products, procedures for maintaining documents and libraries, and organizations involved in configuration management.</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.9 Process Control</p> <p>Establish controlled conditions and document each procedure and process related to development quality.</p>	<ul style="list-style-type: none"> ▪ Software Project Tracking and Oversight ▪ Organization Process Focus ▪ Organization Process Definition 	<p><input type="checkbox"/> Do you document and follow procedures for production, installation, and servicing?</p> <p><input type="checkbox"/> Do you establish controlled conditions for following your procedures?</p> <p>Comments: Once again, ISO-9000-3 expands on ISO-9000 in this vital area, emphasizing replication, delivery, and installation.</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.10 Inspection and Testing</p> <p>All inspections and testing relate to how the product meets the requirements.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Intergroup Coordination 	<p><input type="checkbox"/> Are all of your inspection and testing procedures documented and followed?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.10.1 General</p> <p>Required inspections, tests, and records must be detailed in the quality plan or the applicable procedure.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Intergroup Coordination 	<p><input type="checkbox"/> Does your test procedure identify test objectives, configurations to be tested, and other special concerns?</p> <p><input type="checkbox"/> Are the tests and inspections you perform related (traceable) to requirements?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.10.2 Receiving Inspection and Testing</p> <p>The incoming product must be inspected or otherwise verified before use.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p><input type="checkbox"/> Do your quality plan or documented inspection/test procedures define verification or performance testing?</p> <p><input type="checkbox"/> Does your process account for urgent production purposes where the product must be used before complete inspection and testing?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.10.3 In-process Inspection and Testing</p> <p>The quality plan or procedures describe how the product is verified and/or tested.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your quality plan or procedure document in-process testing? <input type="checkbox"/> Does your procedure allow for holding the product until inspection and testing are complete? <input type="checkbox"/> If so, are there documented procedures for positive-recall? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.10.4 Final Inspection and Testing</p> <p>Before offering the product to the customer, validate the operation of the product in accordance with requirements and specifications.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your quality plan indicate final inspection/testing procedures of products? <input type="checkbox"/> Do you test products in conditions similar to the application environment? <input type="checkbox"/> Does your process require one-for-one validation/verification against specifications and requirements? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.10.5 Inspection and Test Records</p> <p>Your records should show clearly whether the product has passed or failed inspections and/or tests.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Are the acceptance criteria defined and documented? <input type="checkbox"/> Do you record test results as defined in the relevant specification? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.11 Control of Inspection, Measuring, and Test Equipment</p> <p>In order to ensure you are performing accurate inspections and testing, related equipment and software must be controlled.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Technology Change Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have documented procedures to control, calibrate, and maintain related equipment and software? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.11.1 General</p> <p>You need to document the tests and inspections as well as the technical data, equipment, and software used.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do your documented tests ensure measurement uncertainty is known and consistent with the required measurement capability? <input type="checkbox"/> Do you make technical (test criteria) data available to the customer to verify the test equipment/software is adequate? <input type="checkbox"/> Do you document the scope of test tool usage and regularly review them to determine if there is need to improve or upgrade them? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.11.2 Control Procedure</p> <p>Testing equipment must be documented and controlled to ensure calibration.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you use the appropriate inspection and testing equipment, capable of the necessary accuracy and precision? <input type="checkbox"/> Do you keep instrumentation calibrated? <input type="checkbox"/> Do you maintain records concerning the calibration of test equipment? <input type="checkbox"/> Do you ensure that the handling, use, and storage of test equipment are adequate to maintain calibration? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.12 Inspection and Test Status Identify the development stage of the product components and the conformance/non-conformance status of each.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you maintain a current status of tests and inspections for each component of the product? <input type="checkbox"/> Do you maintain a means of identifying the development stage of each component of the product? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.13 Control of Non-conforming Product Prevent non-conforming products from being used or installed.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a documented procedure to keep non-conforming products from unintentional use? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.13.1 General Transfer non-conforming items to another environment to keep them segregated.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your configuration management process allow for segregating non-conforming products and artifacts? <input type="checkbox"/> Do you identify at what points control and recording of the non-conforming product is required? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.13.2 Review and Disposition of Non-conforming Product Define the responsibility and authority for the disposition of non-conforming products.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have documented procedures for reworking, accepting with or without repair for concession, repurposed for alternative applications, or rejected/scrapped non-conforming products? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.14 Corrective and Preventive Action Establish and maintain documented procedures, and record any resulting changes to documented procedures.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Defect Prevention 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you use and maintain documented procedures for implementing corrective and preventative actions? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.14.1 General Perform corrective action to the degree necessary to fix the non-conformity.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Does your configuration management system provide for managing changes to the product and its development processes? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.14.2 Corrective Action Your procedure must include handling customer complaints, investigation of the cause, determination of the action required, and controls to ensure the actions are taken properly.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Intergroup Coordination 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a documented procedure for handling customer complaints? <input type="checkbox"/> Do you verify that corrective action has been taken properly? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.14.3 Preventive Action This includes the root causes of non-conformities, and measures taken to reverse negative trends in process metrics.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Defect Prevention 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you use appropriate sources of information to analyze and eliminate potential causes of non-conformities? <input type="checkbox"/> Do you provide for management review of relevant corrective actions taken? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.15 Handling, Storage, Packaging, Preservation, and Delivery Each of these processes must be documented.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Intergroup Coordination 	<p><input type="checkbox"/> Do you have documented procedures for handling, Storage, packaging, preservation, and delivery?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.15.1 General Each area must be documented as it relates to your product.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p><input type="checkbox"/> In which quality document(s) do you document procedures for each of these areas?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.15.2 Handling Prevent damage, deterioration, or contamination such as viruses.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p><input type="checkbox"/> Does your documented process help prevent infection from viruses?</p> <p><input type="checkbox"/> Do you document procedures for handling magnetic media properly?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.15.3 Storage Store products so as to prevent deterioration, control access to stored products, and ensure different versions are stored separately.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p><input type="checkbox"/> Do you use a designated storage area or stockroom to store products?</p> <p><input type="checkbox"/> Do you control access to the storage area?</p> <p><input type="checkbox"/> Is the storage area protected from electromagnetic and electrostatic affects?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.15.4 Packaging This includes the marking and packaging process and materials used in marking and packaging.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p><input type="checkbox"/> Do you document the procedure(s) to control the packing, packaging, and marking process?</p> <p><input type="checkbox"/> Do these procedures relate directly to requirements?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.15.5 Preservation There are several aspects of preservation, specifically regular backups, copying to replacement media, storage in a protected environment, and storage in a redundant environment for disaster recovery.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p>Which of the following processes do you implement?</p> <p><input type="checkbox"/> Regular backups</p> <p><input type="checkbox"/> Timely copying to replacement media</p> <p><input type="checkbox"/> Storage in a protected environment</p> <p><input type="checkbox"/> Storage in a redundant environment</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.15.6 Delivery Even if the product is delivered electronically, it must be protected from viruses and interception by unauthorized parties.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Intergroup Coordination 	<p><input type="checkbox"/> Do you have a documented procedure for ensuring that each copy is complete and functional before shipment?</p> <p><input type="checkbox"/> Do you document procedures for ensuring the product is delivered intact to the right place?</p> <p><input type="checkbox"/> If sent via the Internet, is the product protected from interception or the introduction of viruses?</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.16 Control of Quality Records</p> <p>Your quality records should be complete, with documented procedures for specific aspects, including identification, collection, indexing, access, filing, storage, maintenance, and disposition.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<p>For which of the following do you have documented procedures for your quality records?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identification <input type="checkbox"/> Collection of records <input type="checkbox"/> Indexing <input type="checkbox"/> Access control <input type="checkbox"/> Filing system <input type="checkbox"/> Storage <input type="checkbox"/> Maintenance <input type="checkbox"/> Disposition <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.17 Internal Quality Audits</p> <p>To determine the effectiveness of your quality system, you need to use documented auditing procedures. Your internal auditor needs to ensure consistency between project quality plans and your organizational quality system.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Software Quality Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you use documented procedures for your internal quality audits? <input type="checkbox"/> Are the results of internal audits recorded accurately? <input type="checkbox"/> Are the appropriate personnel informed of audit findings? <input type="checkbox"/> Is management informed of the results of the audits? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.18 Training</p> <p>This may include training on the software domain as well as project development and management tools and techniques.</p>	<ul style="list-style-type: none"> ▪ Training Program 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you have a documented procedure for identifying training needs for each function of the development/management process? <input type="checkbox"/> Are these training needs being met through internal and/or external courses? <input type="checkbox"/> Do you keep up to date training records for each individual on the project? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.19 Servicing</p> <p>It is important in this product lifecycle phase to document procedures for performing, verifying, and reporting maintenance actions.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> If you maintain your product after installation, do you have a documented procedure to ensure maintenance is performed completely? <input type="checkbox"/> Do you have a documented process for ensuring maintenance is performed in a timely way? <input type="checkbox"/> Do you have procedures for problem resolution, interface changes, and enhancement? <p>Comments: ISO-9000-3 expands on ISO-9000 substantially in this area. It identifies and elaborates on major maintenance activities, related contract issues, maintenance plan issues, and maintenance record keeping.</p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ISO-9000-3 Section	SEI CMM	Self Assessment Questions
<p>4.20 Statistical Techniques Statistics are required to measure and demonstrate process capability as well as product characteristics and conformance to requirements.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you consistently use statistical analyses to measure your process capability? <input type="checkbox"/> Do you use statistical analyses to measure your product's functionality and conformance to requirements? <p><i>Comments: ISO-9000-3 expands on ISO-9000 in this area and lists product characteristics and process capability characteristics which may be candidates for measurement</i></p> <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.20.1 Identification of Need List and identify the statistical methods and tools used to measure process capability and product characteristics.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering ▪ Technology Change Management 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you carefully select specific statistical methods and tools used to measure your development and management process? <input type="checkbox"/> Do you carefully select the statistical methods and tools used to measure your product characteristics and conformance to requirements? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>
<p>4.20.2 Procedures You will need to establish and maintain documented procedures to implement, control, and record your statistical process.</p>	<ul style="list-style-type: none"> ▪ Software Product Engineering 	<ul style="list-style-type: none"> <input type="checkbox"/> Do you document your statistical measurement process and use it consistently? <input type="checkbox"/> Do you keep accurate and accessible records of your quality metrics? <p style="text-align: right;">Needs research/work <input type="checkbox"/></p>

ASSESSMENT SUMMARY

We are pleased to provide this software Quality Assessment as a courtesy to you.

Although the term “Quality” has an emotional content, aspects of quality can be measured in many respects. Even in cave-man times, the “straightness” aspect of an arrow affected how far and accurately it may be shot – quality was literally a matter of life and death.

These questions should have helped you to get a better picture of your quality process. Perhaps they opened your eyes a little to the intent of quality standards such as ISO-90003 and the SEI CMM. If you depend on your spears to make a living, you need to make them with qualities you can measure and improve.

Thank you for your valuable time.

Respectfully submitted,
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