

QA.1 SQA Function Establishment

1 D O M A QA.1.1 Initiate SQA function

1 D O M A QA.1.1.1

The software organization manager establishes the need for quality by defining a Software Quality Policy which includes high level quality objectives to be addressed, what should be done to achieve the objectives and ideally the quality management standard that will be adopted.

QA.A provides a sample copy of a Software Quality Policy.

1 D O M L QA.1.1.2

Initiators e.g. software organization management, internal audit groups etc., should prepare a preliminary report stating advantages versus disadvantages and the costs versus benefits of setting up an SQA function. This preliminary report could result from studies conducted or an exercise carried out to include:

- a) performing some software quality activities e.g. SQA reviews, at critical junctures of a software life-cycle, defect analysis, customer satisfaction etc.;
- b) providing a summary of the results of the tasks conducted, recommendation of how the SQA function should be staffed, its authority and responsibilities, its organization structure, to whom the group will report to and the method of reporting findings.

1 D O M A QA.1.1.3

When completed the policy or the report should be reviewed with or presented to the individual the software organization manager reports to by the initiators to reach consensus for establishing an SQA function.

1 D O M A QA.1.2 Nominate SQA manager

1 D O M A QA.1.2.1

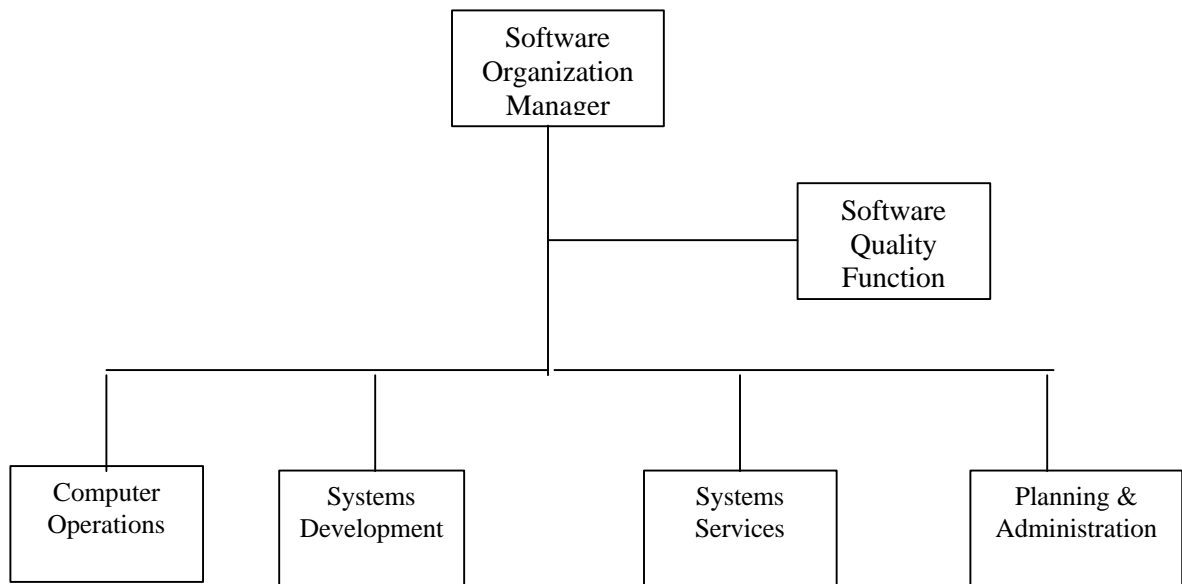
When consensus is reached to establish the SQA function, the software organization manager with support from e.g. user management, internal audit management etc. nominates an SQA manager who is available and possesses the necessary quality assurance specific and people related skills knowledge and experience.

QA.B provides a brief description of the basic qualifications of the Software Quality Assurance Manager (SQAM).

1 | D O M A QA.1.2.2

The SQAM and the SQA function he/she manages should ideally be a staff function reporting directly to the manager of the software organization where quality issues may be raised to the appropriate level to receive the necessary action (See Figure 1 below).

Figure 1: Suggested Reporting Scheme for the SQA Function



QA.2 SQA Charter Establishment

1 | D O M A QA.2.1 Establish the draft SQA charter**1 | D O M A** QA.2.1.1

The SQAM should establish an SQA charter which represents a job description for the quality function that will:

- a) Determine the SQA function responsibilities and authorities;
- b) Ensure that the SQA function is correctly positioned to receive the needed authority and management support to successfully accomplish the assigned tasks;
- c) Limit the scope of the quality function to a group of achievable tasks to include those in:

- development of standards and guidelines;
 - review of general controls;
 - service as a technical advisor on software matters;
 - review of applications;
- d) Notify the affected parties of the responsibilities and authorities of the SQA group.

1 D O M L QA.2.1.2

In drafting the charter, the SQAM should establish a task force comprising:

- a) The SQAM;
- b) The manager or the deputy of the software organization;
- c) One or more software project managers;
- d) One or more key users of software applications and/or services;
- e) The manager or deputy of computer operations;
- f) The general auditor or software audit manager of the organization;
- g) A member of the executive management (suggest this individual be the chairman of the task force).

1 D O M L QA.2.1.3

In addition, the task force should perform the following tasks:

- a) By evaluating the quality problems in the user and software areas, compile and prioritize a list of tasks to be performed by the SQA group;
- b) Estimate the amount of resources required to accomplish each task;
- c) Determine with management consent the amount of manpower that will be allotted to staff the SQA function;

QA.C provides a sample copy of an SQA Charter.

- d) In the SQA charter, separate those tasks that can logically be accomplished with available resources from those that should be accomplished when time becomes available or additional resources are added.

1 | D O M A | QA.2.2 Review and approve the SQA Charter

1 | D O M A | QA.2.2.1

Once the SQA charter has been drafted, the SQAM/task force should send it to key members of the organization's management for review and concurrence or recommendations, thus ensuring that management's quality concerns will be addressed.

1 | D O M A | QA.2.2.2

The SQA charter should be formally approved (endorsed) by key members of the organization's management to ensure that the SQA function receives the needed authority and management support in carrying out its responsibilities.

1 | D O M A | QA.2.3 Communicate approved SQA charter

1 | D O M A | QA.2.3.1

The approved SQA charter accompanied by the Software Quality Policy where appropriate, should be distributed and/or officially presented to all software organization and user staff to ensure understanding and to solicit support for the SQA function in carrying out its responsibilities.

QA.3 SQA Process Establishment

1 | D O M A | QA.3.1 Staff the SQA function

1 | D O M A | QA.3.1.1

The SQAM selects quality analysts normally from the most senior people in the software, user or other organizations to serve in the SQA function.

Table 1 below provides an analysis of the advantages and disadvantages of selecting SQA analysts from various sources.

Table 1: Sources of Software Quality Assurance Analysts

Source	Advantages	Disadvantages
Senior software analyst	- highly respected - skilled in software development	- success dependent on prestige of individual
Other software services personnel	- skilled in software development - proven track record	- may not have the respect of senior software analysts
User personnel	- independent view of software procedures - understands user concerns	- may not know enough software engineering - may not have the respect of senior software analysts
SQA professionals from other organizations	- skilled in software engineering - knows how to perform SQA tasks	- does not know organization - may not have the respect of senior software analysts
SQA-related skills e.g. industrial engineer	- knows how SQA works - skilled in quality improvement programs	- may not know enough software engineering - may not have the respect of software staff

1 | D O M A | QA.3.2 Train the SQA function

1 | D O M A | QA.3.2.1

The SQAM should ensure that SQA analysts receive regular training to update and upgrade their skills in software quality and IT skills.

1 | D O M A | QA.3.2.2

If the SQA analyst comes from a field other than Information Technology (IT), he/she must learn IT concepts.

2 | D O M A | QA.3.2.3

Other methods by which SQA analysts are trained include:

- a) On-the-job training – The SQAM instructs the SQA analyst in how to perform their function;
- b) SQA training courses – Many SQA skills courses are available from Quality / Productivity organizations locally and internationally.;

- c) Interfacing with systems development methodologies
 - many systems development methodologies explain how to perform quality control tasks;
- d) Study-related disciplines – Many courses teach disciplines that are helpful to the SQA function including:
 - Business systems design;
 - Auditing (emphasis on fact-finding);
 - Control design (emphasis on detecting and preventing problems);
 - Statistical quality control.
- e) Attend the programs which focuses on building software quality skill areas including:
 - communications;
 - human resource principles;
 - training and development;
 - quality management;
 - quality assurance;
 - quality control;
 - quantitative methods;
 - reviews;
 - auditing and control;
 - testing;
 - vendor control;
 - standards;
 - disaster recovery and security;
 - management techniques;
 - change management;
 - principles of IT.

1 | D | O | M | A | QA.3.3 Develop a SQA plan

1 | D | O | M | A | QA.3.3.1

The SQAM should develop an SQA plan for the SQA function based on:

- a) The software organization's mission – strategic goals and initiatives;
- b) The software organization's quality policy;
- c) The SQA charter;
- d) The types of projects covered;
- e) The identified defect-prone products and processes.

1 D O M L QA.3.3.2

The SQAM could use the same task force and process that established the draft charter to assist in developing the SQA plan (see QA.2.1.2 above).

1 D O M A QA.3.3.3

The SQAM could use the same task force and process that established the draft charter to assist in developing the SQA function plan (see QA.2.1.2 above).

- a) Activity/Task – the work to be performed by the SQA group;
- b) Objective – the specific SQA objective to be accomplished. It is best when this is directed at a specific defect or category of defects;
- c) Quantitative measure of success – the specific measurable objective to be accomplished. Note that this is normally defect reduction; e.g. reducing production abnormal terminations by 30%;
- d) Individual responsible – the name of a single individual in the SQA group who will be responsible for accomplishing this objective;
- e) Resources – the amount of resources including people allocated to accomplish this objective;
- f) Accomplishment schedule – The checkpoint dates at which specific activities are to be accomplished.

1 D O M A QA.3.3.4

For software projects covered by the SQA plan, the SQAM should ensure that a Quality Plan exists for each and every project.

1 D O M A QA.3.3.5

The Quality Plan should cover the following areas:

- a) Management structure and processes;
- b) Project documentation plans;

QA.E provides a brief discussion of Quality Plan tasks and activities in each of these areas.

- c) Adherence to standards, practices, conventions and metrics;
- d) Requirements on reviews and audits;
- e) Monitoring of testing activities;
- f) Management of software problems;
- g) Use of tools, techniques and methods;
- h) Code and media control;
- i) Supplier control;
- j) Project records collection, maintenance and retention;
- k) Staff training;
- l) Software risk management.

QA.F provides a documentation template for documenting the Quality Plan for a project.

1 | D O M A | QA.3.4 Review and approve the SQA plan

1 | D O M A | QA.3.4.1

Once the SQA plan has been drafted, the SQAM/task force should send it to key members of the software organization's management for review and concurrence or recommendations, thus ensuring that software management's quality concerns will be addressed.

1 | D O M A | QA.3.4.2

The SQA plan should be formally approved (endorsed) by key members of the software organization's management to ensure that the SQA group members receive the needed authority and management support in carrying out their work.

QA.4 SQA Activities Deployment

1 | D O M A | QA.4.1 Conduct SQA activities in accordance with SQA plan

1 | D O M A | QA.4.1.1

The SQAM should lead the deployment of SQA activities in accordance to the SQA plan.

1 | D O M A | QA.4.1.2

Concurrently, to ensure understanding and support, the SQAM should lead regular awareness sessions of approved SQA plan to all management and staff of the software organization and key user groups.

1 | D O M A | QA.4.2 Adjust the SQA Charter and Plan

1 | D O M A | QA.4.2.1

The SQAM should seek the agreement of the task force that established the SQA charter and plan (see QA.2.1.2 and QA.3.3.2) to:

- (a) address any software quality issues that are not resolvable at execution level, and
- (b) make any adjustments to the plan.

2 | D O M A | QA.4.3 Deploy other SQA related activities

1 | D O M A | QA.4.3.1

Apart from adhering to the SQA plan, some of the more effective tasks in making quality happen in a software organization are:

- a) Reward quality;
- b) Use concepts from related disciplines;
- c) Demonstrate the value of quality;
- d) Raise software quality to an organization-wide program;
- e) Market quality;
- f) Use quality management practices.

Suggestions for implementing these tasks are provided in QA.D.

QA.5 Review and Audit

1 | D O M A | QA.5.1 Review SQA plan results

1 D O M A QA.5.1.1

The SQA group should regularly (e.g. monthly) collect, analyze and report the results of improvements to software related work e.g. reduction in the number of user reported software defects, to management and staff in the software and user organizations.

1 D O M A QA.5.1.2

Where appropriate, the SQA group should take corrective actions in the near term with the support of management and staff in the software and user organizations.

2 D O M A QA.5.1.3

In the longer term, the SQAM should plan any preventive actions to take place during the SQA plan review described in section QA.3.3.

2 D O M A QA.5.2 Audit SQA function**2 D O M A** QA.5.2.1

On a regular basis, an independent group, eg, internal audit, should conduct a systematic and independent examination of SQA activities to determine whether they are compliant with SQA plans and objectives.

2 D O M A QA.5.3 Review SQA charter and plan**2 D O M A** QA.5.3.1

The SQAM should regularly (e.g. three monthly intervals) conduct satisfaction surveys with users of SQA services i.e. software and user management and staff, to evaluate where these SQA services may be improved, terminated or reintroduced.

2 D O M A QA.5.3.2

Based on the results of customer satisfaction surveys, review of SQA plan results and audit results, a regular management review meeting should be held to revise the SQA charter and plan.