

Project Workflow Management¹

Quality Management Process²

By Dan Epstein

Note: *This article is based on the book [Project Workflow Management: A Business Process Approach](#) by Dan Epstein and Rich Maltzman, published by J Ross Publishing in 2014. The book describes PM Workflow® framework, the step-by-step workflow guiding approach using project management methods, practical techniques, examples, tools, templates, checklists and tips, teaching readers the detailed and necessary knowledge required to manage project “hands-on” from scratch, instructing what to do, when to do and how to do it up to delivering the completed and tested product or service to your client.*

The project workflow framework is the result of Dan’s research into the subject, having the following objectives:

1. Create the virtually error-free project management environment to ensure significant reduction of project costs
2. Reduce demands for highly qualified project managers using the step-by-step workflow guiding approach.

While PM Workflow® is the continuous multi-threaded process, where all PM processes are integrated together, this article will attempt to describe the resource management group of processes as a stand-alone group that can be used independently outside of PM Workflow® framework. It will be difficult in this article not to venture into processes outside of the current subject, such as planning, quality, communications and other management processes, so they will be just mentioned. However, to get full benefit and the error free project management environment, the complete implementation of PM Workflow® is required. In order to understand how PM Workflow® ensures this environment, I strongly recommend reading my article [Project Workflow Framework – An Error Free Project Management Environment](#). in the PMI affiliated projectmanagement.com (<https://www.projectmanagement.com/articles/330037/Project-Workflow-Framework--An-Error-Free-Project-Management-Environment>)

For more information, please visit my website www.pm-workflow.com

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Purpose

The Quality Management process is a set of planned and executed project activities to ensure that all project deliverables conform to the documented and agreed-upon requirements, and meet documented stakeholder expectations.

Quality Management controls all PM processes described in this book and ensures the project has the required quality. The main vehicle to achieve that target is the quality audits and reviews which are planned and executed. All non-compliance issues found in reviews must be resolved by the project team or escalated to senior management in those cases when local resolution is not possible. If several different departments or organizations are involved in the project, the set of Quality Management processes must be recognized and implemented on the enterprise-wide level. It has already been mentioned in the Requirements Frame section that quality is conformance to the documented and approved requirements and specifications and, therefore, it is not the same as the 'perfect' performance that the client and business users would like to have. Quality is not a part of any project variable, unlike cost, time and resources. Quality can never be compromised and it cannot be changed under any circumstances. If the project duration, budget or resources are not realistic to implement all business requirements, then some requirements should be dropped or changed to reflect the new situation as mutually agreed with the business. **This newly defined set of requirements will become a new quality standard of the project.** Still, all deliverables must be produced with the agreed quality-- no less and no more.

No quality variations may ever exist in the deliverable, since the documented quality is either **there** or it is **not there**. Therefore, it is not possible to exceed the deliverable quality expectations, because that would mean that the product has the unplanned, unbudgeted elements of scope and does not conform to agreed specifications. The project may be ahead of or behind the schedule, the cost may be below or above the budget, but it is impossible to have it of a better or lesser quality.

Quality Management of a project means building and implementing plans to meet the documented quality expectations of clients and stakeholders. The planning effort contains two major groups of processes:

1. Quality Assurance or QA (processes P2-1-1 through P2-1-7)
2. Quality Control or QC (processes P2-2-1 through P2-2-7)

There is major difference between QA and QC. QA focuses on environment in which deliverables are created and the guiding processes. In fact, the key distinguishing aspect of QA is that it is all about process. QC, on the other hand, focuses on the inspection of deliverables and defects removal to ensure they are complete and satisfy the stated quality. QA and QC terms cannot be used interchangeably.

Quality Management activities start at the beginning of the Requirements Frame and end after the project is delivered to client at the end of the Closing Frame.

Quality Assurance (QA)

The purpose of Quality Assurance is to build quality into deliverables from day one of the project, rather than to inspect finished products. QA is all about project processes. The major vehicle of QA activities is the QA audit. The QA audit will judge the quality of the future deliverables *based on the quality of the processes used for their creation*. QA Audits are conducted by QA Representatives with active participation of Project Managers and their teams. Auditors do not have to know your project well, but they must be trained to ensure project compliance with processes such as Requirements Management, Risk Management, the Scope Change Control, Project Tracking and all other applicable processes, which **build the quality into the project**. Even if a project is on schedule and within the budget, poor results of QA audits will credibly predict a troubled project in near future, unless quality gaps are quickly eliminated.

Usually, when senior managers receive project documentation for sign off, they cannot rely on their first-hand knowledge of project details, but rather they sign off based on indirect circumstantial evidence of quality. If, let us say, the senior business managers are required to sign off on the Business Requirements Document, they will probably attempt to verify with the leading client that the following is true:

- Business users from all the relevant business areas participated in gathering requirements and agreed with the Business Requirements Document.
- Lead client signed off the document.
- The document is clear and unambiguous, containing only necessary requirements.
- The delivery and the business organizations are comfortable with the proposed delivery content, the schedule and the project estimates.
- The Risk Assessment had been recently conducted and the conclusion is that the overall project risk is low.
- The Business Requirements Document review was successful with no open issues left.

If this is indeed the case, business managers will sign off the Business Requirements document without personally going through the entire document.

QA audits are conducted many times throughout the project in accordance with the developed schedule (and in particular the Quality Management Plan). The bigger the project, the more quality audits activities are required.

Ideally, the QA Department is an independent unit in charge of all company QA activities. They schedule QA audits of all projects and send QA Representatives to conduct them. However, if the QA Department does not exist, the role of QA Representative may be played by the QA trained representatives of the delivery organizations, who are not team members of the project being reviewed.

Except for the small projects under \$100,000, most QA activities are led by a QA Representative and performed by all members of the Delivery Team. In small projects, the QA Representative's function may be delegated to a QA-trained Project Manager.

All QA audits must be planned. While it is expected that the QA Representatives propose the plan of QA audits, it is the Project Manager's responsibility to create a QA Plan and document it in

PCB. The Quality Plan identifies quality standards and the way to satisfy them. Development of the Quality Plan includes:

- Definition of all types of QA audits
- Development of checklists for all types of QA audits
- Established frequency of each QA audit type
- Assigned QA resources
- Scheduled QA audits
- Scheduled QA training

QA Audits evaluate project performance on a regular basis to ensure that the project satisfies quality standards. QA Representatives start conducting QA audits no later than four weeks after the beginning of a project and then at least quarterly. Project audits also take place when new high risks are encountered and when the project has issues with cost or schedule (more than 10% variance between actuals and the plan). The QA audit reports are forwarded to the QA Manager, if that position exists, and also to senior delivery managers. In addition to QA audits, QA Representatives verify that the project runs as planned and all required project documentation and other deliverables are produced in accordance with the schedule. The evidence of QA Audits must be recorded in the Project Control Book (PCB). Each of the project's deliverables must also pass a separate QC review, as described later, in order to remove defects and confirm their correctness and fitness to the purpose. All elements of non-compliance must be reported to executive management.

During the monthly Executive Project Status Review, as described in the Communication Planning section, the PM reports to executives on QA project activities. This information must be reviewed and initialed by the QA Representative prior to the Executive Project Status Review.

The main vehicle for QA Audits is the use of checklists. Checklists have questions, which must be answered YES or NO. If the answer is YES, there must be a documented proof of the answer, such as meeting minutes, memos, documents, emails and protocols documented in the PCB. If the answer is NO, then there is a gap, which must be closed in order to get a passing grade. All checklists in the audit must have all questions answered YES. For example, the checklist question: "Does the client understand that even small scope changes will likely affect project cost and schedule?" must have proof in the form of the meeting minutes with the client, where this is clearly explained and agreed upon.

Each audit will be rated PASS or FAIL. In case of failure, the comment section of each audit must contain comments explaining the reason for failure and a specific list of actions to rectify the situation. Before forwarding results of audits to the Project Manager and the senior delivery manager, each audit must be signed by the QA Rep. There must also be a proof that the Project Manager received results. In case of deficiencies, a deadline must be established to fix the noncompliance. If the issue is not fixed by the deadline, the issue must be escalated by the QA Manager to the senior delivery manager.

QA Audit documentation consists of the front page and a set of checklists described below. All applicable checklists must be used. QA Review process P2-1 consists of the following:

1. Inform PM of QA Audits and send Out Checklists (P2-1-1)

2. Answer Checklist Questions (P2-1-2)
3. Schedule QA audit (P2-1-3)
4. Conduct QA Audit (P2-1-4)
5. Eliminate Gaps (P2-1-5)
6. Rate QA Audit (P2-1-6)
7. Escalate Non-Compliance (P2-1-7)

Quality Assurance Process Flow

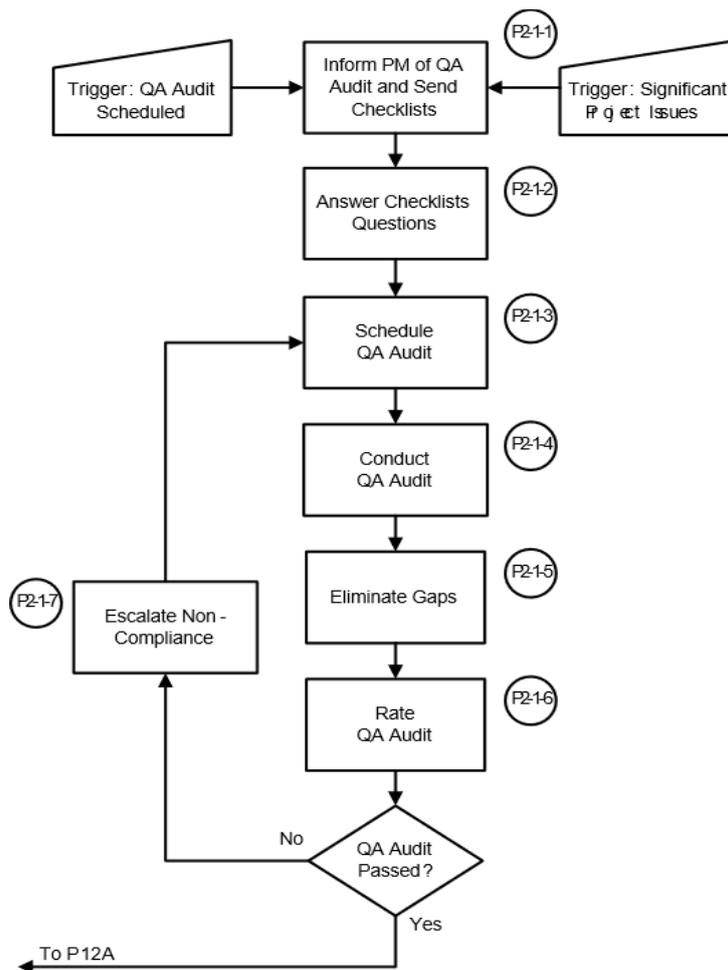


Fig 14-1 Quality Assurance Audit

QA Process flow is shown in Fig 14-1. A QA Audit is triggered by the QA Plan schedule or when significant issues are found in the project. Approximately two weeks ahead of the scheduled audit, a QA Representative sends a reminder of the upcoming QA audit to the Project Manager, as indicated in the Inform PM of QA Audit process P2-1-1. Along with the reminder, all relevant checklist forms must be sent to the Project Manager, who, in the process Answer Checklists Questions (P2-1-2) should answer all questions. Checklists are only considered complete when answers to all questions are YES, and documented proof is available. All questions answered NO mean that a gap between current practices and expectations exists. Any waiver to this requirement,

as an exception, must be provided by mutual consent between the QA Manager and a senior delivery manager and documented in the PCB. All gaps must be eliminated before the scheduled QA Audit.

Approximately one week before the audit, in the process Schedule QA Audit (P2-1-3), the QA Representative sends an invitation to the Project Manager for a QA audit at the specified place and time. Often the audit venue is the Project Manager's office, because most project documentation can be accessed from there.

At the scheduled date and time, the QA Representative and the Project Manager go through all checklists, one question at the time in the process Conduct QA Audit (P2-1-4). Other delivery team members, while not usually present during the entire audit, may still be called and questioned. The Project Manager must provide a detailed explanation to all answers. If the QA representative is convinced that YES answers are correct, it won't always be necessary to request documented proof for all answers, even though two or three answers in each checklist must still be verified. If doubt exists, the documented proof must be presented and delivery team members may be questioned. The QA Representative must provide comments in the Comments area of each checklist, if issues are found during the audit. At the end of the audit, the Project Manager is provided with a copy of all checklists, while originals are kept by the QA Representative.

After the audit, the Project Manager usually has three to four days, or as agreed otherwise, to fix all issues of non-compliance in the process Eliminate Gaps (P2-1-5). A document must be prepared and forwarded to the QA Representative by the Project Manager, which describes measures taken to eliminate all gaps.

After review of the modified checklists and the corresponding documentation, the QA Representative provides the audit rating in the process Rate QA Audit (P2-1-6). If the QA Representative is satisfied with results, the rating will be PASS. The answer to the control point question (QA Audit Passed?) is YES and the audit is considered complete. The process flow enters the Estimating process P12A. The rating must be documented in PCB.

If all gaps were not eliminated as required, the audit rating will be FAIL and the answer to the control point question (QA Audit Passed?) is NO. The report must be forwarded by the QA Representative to the QA Manager in the process Escalate Non-Compliance (P2-1-7), who would take the issue to the senior delivery management team. If no QA Manager position exists, then the report is forwarded directly to the senior delivery management team. Management will review reasons for non-compliance and take corrective actions. When all issues are resolved, the QA representative is notified, and a new QA audit is scheduled.

QA Audit Front Page

The following is a list of twelve QA Audit types:

1. Project Management Process
2. Statement of Work
3. Financial Management
4. Client Satisfaction
5. Change Control

6. Staffing
7. Communication
8. Project Planning
9. Project Tracking
10. Project Closing
11. Configuration Management
12. Subcontract/Offshore Management

The Quality Assurance Audit Form (Front Page) is displayed in Table 14-1. All answers must be YES with the supporting documentation available. Answer NO points to a gap between the required and existing quality. The audit rating in this case will be FAIL.

Table 14-1 Quality Assurance Audit

Quality Assurance Audit	
QA Rep Name	
Project Name	
Project Manager Name	
Lead Client Name	
Budgeted Project Cost	
Estimated Project Cost	
Last Risk Assessment Rating: _____ Date of Risk Assessment: _____	
Audit Types (check all applicable) <input type="checkbox"/> PM Process <input type="checkbox"/> SOW <input type="checkbox"/> Client Satisfaction <input type="checkbox"/> Financial <input type="checkbox"/> Change Control <input type="checkbox"/> Staffing <input type="checkbox"/> Communication <input type="checkbox"/> Planning <input type="checkbox"/> Tracking <input type="checkbox"/> Configuration <input type="checkbox"/> Closing <input type="checkbox"/> Subcontractor/Offshore	
Audit Date: _____ Total Checklists in the Audit: _____ Audit Rating: <input type="checkbox"/> Pass <input type="checkbox"/> Fail QA Rep. Signature _____	
Repeat Audit Date: _____ Total Checklists in the Audit: _____ Repeat Audit Rating: <input type="checkbox"/> Pass <input type="checkbox"/> Fail QA Rep. Signature _____	
Next Scheduled Audit Date: _____	
Comments:	

Project Management Process Audit

The Project Management Process audit is an overall audit, which ensures that the project is managed in accordance with the existing mandatory project management processes and Quality

Assurance. The Overall Project Management Checklist, as show in Table 14-2 is a tool for the audit. The checklist also confirms that all project costs are taken into consideration.

Table 14-2 Overall Project Management Checklist

Overall Project Management Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Is the compliance with all project management processes mandatory on the organization level?	
2	Are delivery team members familiar with the project management processes?	
3	Does the project proceed in accordance with the detailed project plan?	
4	Is the project stable and no major scope changes expected?	
5	Does the client understand that even small scope change will likely affect project cost and schedule?	
6	Is the project within the budget and on schedule (variance is under 10% in schedule and cost) and no foreseeable delays are expected?	
7	Is the cost of QA activities included in the project cost?	
8	Is the cost of Risk Management activities included in the project cost?	
9	Is the latest project status report reflects up to date information?	
10	Do you have the Project Control Book, which stores ALL project related information?	
11	Have the Project Manager and Delivery Team members had QA training?	
12	Does the PCB contains QA training materials and the minutes of the QA training for PM and the delivery team?	
13	Is there a QA plan developed for the project, which includes audit dates?	
14	Are there records in PCB regarding all QA activities and all its metrics?	
15	Is the Traceability Matrix updated with every scope change?	
Comments:		

Statement of Work Audit

The SOW Audit, shown in Table 14-3, confirms that all business requirements can be implemented using selected methods and technology at the quoted price according to the presented timeframe and milestones. This review takes place after the Statement of Work is completed, but before signing it off. The review is attended by the QA Representative, the Project Manager, relevant members of the Delivery Team and Subject Matter Experts. SOW Audit takes place once, before SOW delivery to client.

Table 14-3 Statement of Work Audit

Statement of Work Checklist		
Project Name: _____		Date: _____
PM Name: _____		Client Name: _____
1	Are the Statement of Work guidelines exist and mandatory to follow?	
2	Will the proposed solution satisfy all business requirements?	
3	Was the peer review of the proposed implementation conducted?	
4	Was the cost estimate produced and verified by other estimating method?	
5	Was the client price approved by the qualified economist?	
6	Is the milestone implementation schedule reasonable and don't impose an undue hardship on delivery team?	
7	Are the SOW terms and conditions clear and complete?	
8	Are the correct assumptions made?	
9	Are all legalities taken into consideration?	
Comments:		

Client Satisfaction Audit

Managing client expectations is one of the Project Manager's responsibilities. In doing so, it is important that client expectations be based only on existing project documentation, such as the signed off Business Requirement Document and the project plan. Client Satisfactory Rating is based on the customer filling out the Client Satisfaction Survey Form using the Client Satisfaction Survey tool downloadable from www.pm-workflow.com. A rating under 85% should be considered unsatisfactory. The Screenshot-Client Satisfaction Survey Tool is shown on Fig 14-2 and the Client Involvement Audit Checklist is in Table 14-4.

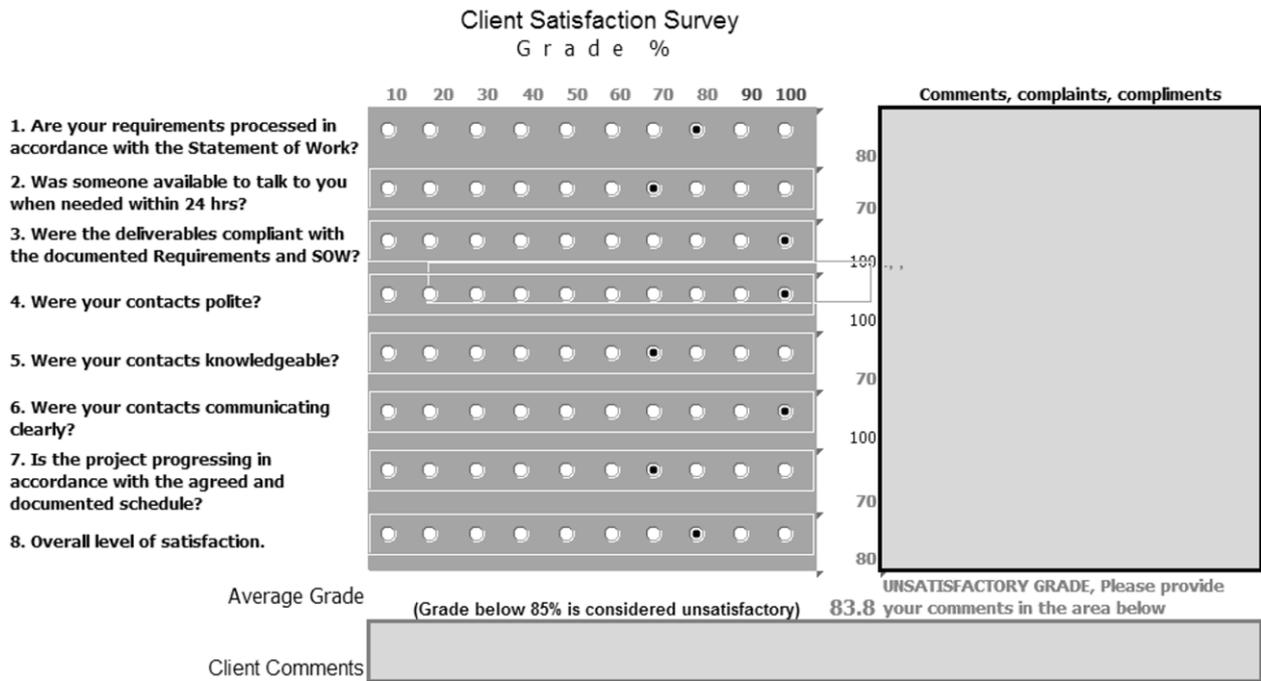


Fig. 14-2 Client Satisfaction Survey Tool

Table 14-4 Statement of Work Checklist

Statement of Work Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Are the Statement of Work guidelines exist and mandatory to follow?	
2	Will the proposed solution satisfy all business requirements?	
3	Was the peer review of the proposed implementation conducted?	
4	Was the cost estimate produced and verified by other estimating method?	
5	Was the client price approved by the qualified economist?	
6	Is the milestone implementation schedule reasonable and don't impose an undue hardship on delivery team?	
7	Are the SOW terms and conditions clear and complete?	
8	Are the correct assumptions made?	
9	Are all legalities taken into consideration?	
Comments:		

Financial Audit

The financial audit evaluates project performance using Earned Value Analysis. Earned Value Analysis (EVA) can be performed using the Earned Value Analysis Tool, shown on Fig 14-3, which may be downloaded from the publisher’s website. In the tool, BAC, AC, EV and PV must be entered and CV, SV, CPI, SPI, EAC and VAC will be automatically calculated. More details about Earned Value Analysis will be provided in the Earned Value Analysis and EVA Tracking process (C1).

Earned Value Analysis		Today (mm/dd/yyyy) 7/1/2013
Budget at Completion (BAC) – Initial Budget	\$1,000,000	
Project Start Date (mm/dd/yyyy)	1/2/2013	
Planned End Date (mm/dd/yyyy)	12/30/2013	
Actual Cost (AC) - Actual Cost of Work	\$550,000	
Earned Value (EV) - Value of Completed Work	\$490,000	
Planned Value (PV) - Planned Cost of Work	\$500,000	
Cost Variance (CV=EV – AC)	-\$60,000	Over the budget
Schedule Variance (SV=EV-PV)	-\$10,000	Behind the schedule
Cost Performance Index (CPI=EV/AC)	0.89	
Schedule Performance Index (SPI=EV/PV)	0.98	
Estimate At Completion (EAC=BAC/CPI)	\$1,122,449	
Variance at Completion (VAC=BAC-EAC)	-\$122,449	
Estimated Completion Date	1/7/2014	
<div style="display: flex; justify-content: space-around;"> Calculate Clear Calc Clear ALL </div>		

Developed by Dan Epstein, 2010

Fig. 14-3 Earned Value Analysis

The Financial Audit Results is displayed in Table 14-5 and the Financial Audit Checklist in Table 14-6.

Table 14-5 Financial Audit Results

Financial Audit Results		
Project Name: _____		Date: _____
PM Name: _____		Client Name: _____
BAC: _____	AC: _____	EV: _____ PV: _____
1	Cost Variance (CV)	
2	Schedule Variance (SV)	

3	Cost Performance Index (CPI)	
4	Schedule Performance Index (SPI)	
5	Estimate at Completion (EAC)	
6	Variance at Completion (VAC)	
7	Overall Project Cost Status (1.Over the budget, 2. Under the budget or 3.On budget)	
8	Overall Project Schedule Status (1.Behind the schedule, 2.On schedule or 3.Ahead of schedule)	
Comments:		

Table 14-6 Financial Audit Checklist

Financial Audit Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Is the project running on schedule within the approved budget (up to 10% of schedule and cost variance)?	
2	Are the actual efforts spent captured at least weekly?	
3	Are the captured actual efforts compared to planned ones at least weekly?	
4	Have other costs, such as travel, equipment etc captured at least weekly?	
5	Is the Earned Value Analysis performed at least weekly?	
6	Have the approved rates been established, periodically reviewed and used for cost calculations?	
7	Has the cost of the approved scope changes, new issues and risks been captured and budget adjusted accordingly?	
8	Is the approved budget adjustment included in new baseline?	
9	In case of troubled projects, are steps made to ensure that budget will be sufficient to correct the situation and complete the project as agreed?	
10	Is the overall cost of the project adjusted in accordance with total number of the decision making clients, who are allowed to forward their decisions directly to Project Manager? (10% cost increase for every additional decision making client above one).	
Comments:		

Change Control Audit

The Change Control Checklist is shown in Table 14-7.

Table 14-7 The Change Control Checklist

Change Control Checklist	
Project Name: _____ Date: _____	
PM Name: _____ Client Name: _____	
1	Does the Change Control process exist and mandatory to follow?
2	Are all the submitted change requests documented?
3	Are all the approved change requests documented?
4	Are all the rejected change requests documented?
5	Are all the implemented changes approved?
6	Are the change management statistics documented?
7	Are all the implemented scope changes reflected in Traceability Matrix?
Comments:	

Staffing Audit

The Staffing Audit Checklist is displayed in Table 14-8.

Table 14-8 Staffing Audit Checklist

Staffing Checklist	
Project Name: _____ Date: _____	
PM Name: _____ Client Name: _____	
1	Is there Project Staffing Plan available?
2	Have all documented staffing requests been approved by Resource Managers?
3	Are there any unresolved staffing issues?
4	Are the delivery team skills and resources sufficient for the project?
5	Is the delivery team members' performance within industry standards?
6	Are the subcontractors' team skills and resources sufficient? (If applicable)
7	Is the subcontractors' team members' performance within industry standards? (If applicable)
Comments:	

Project Communications Audit

The Project Communication Audit Checklist is shown in Table 14-9.

Table 14-9 Project Communication Audit

Project Communications Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Does the Project Communication process exist and mandatory to follow?	
2	Is there a documented Communications Plan available?	
3	Is there a documented list of all project stakeholders and their coordinates available?	
4	Is a single focal point available for contact with the client organization?	
5	Does a weekly status report meeting with the client take place?	
6	Does a monthly status report meeting with the senior business manager take place?	
7	Does a monthly status report meeting with delivery management take place?	
8	Are there any client expectations beyond those documented in SOW?	
9	Is a financial report included in the monthly meeting with delivery management?	
10	Is a QA report included in the monthly meeting with delivery management?	
11	Is the client available within 24 hours to discuss urgent issues?	
12	Does the client provide answers and signoffs on time?	
13	Does the client strictly adhere to the Scope Change process?	
14	Are the weekly reported hours by delivery team approved by client on time?	
Comments:		

Project Planning Audit

The Project Planning Audit Checklist is displayed in Table 14-10.

Table 14-10 Project Planning Audit

Project Planning Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Does the Project Planning process exist and mandatory to follow?	
2	Is there a documented Risk Management plan and the regularly scheduled risk assessments?	
3	Are the QA Plan and regular QA audits included in the Project Plan?	
4	Are the QC Reviews included into the Project Plan and conducted for each deliverable?	
5	Does the estimating process exists and used for estimating?	
6	Does the verification of estimates used in the estimating process?	
7	Have the delivery team members agreed with estimates?	
8	Are the project estimates documented?	
9	Are all WBS tasks under 40 hours?	
10	Are the risk contingency plans documented and included into the Project Plan and into the overall estimates?	
11	Are all approved change request implementation plans made and entered on time into the overall Project Plan?	
12	Have all task dependencies been identified and entered into WBS?	
13	Have the available and qualified resources been assigned to all project tasks?	
14	Are the client significant milestones included in WBS?	
Comments:		

Project Tracking Audit

The Project Tracking Audit Checklist is shown in Table 14-11.

Table 14-11 Project Tracking Audit

Project Tracking Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Does the Project Tracking process exist and mandatory to follow?	
2	Has a project scheduling and tracking tool, such as MS Project, NIKU, Primavera etc. been used on the project?	
3	Are all delivery team members provide weekly status of the work assigned to each member?	
4	Is the project plan updated weekly to reflect the actual hours of the completed tasks and tasks being processed?	
5	Is the weekly delivery team status meeting scheduled and conducted?	

6	Is the presence at the delivery team status meeting is compulsory for all team members?	
7	Is the cost of weekly delivery team status meeting is included in the overall project estimates?	
8	In case of issues, are the corrective actions taken and reported by the scheduled date?	
9	Are actuals collected, documented and used to determine the project status at least weekly?	
10	Are all completed project tasks exist in the WBS?	
11	Is the escalation path established and used for the delivery team issues that can't be resolved by due date?	
Remarks:		

Subcontract/Offshore Management Audit

The Subcontractor/Offshore Management Audit Checklist is shown in Table 14-12.

Table 14-12 Subcontractor/Offshore Management

Subcontract/Offshore Management Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Has the subcontractor selection been competitive and the subcontractor's organization is thoroughly researched before granting the contract?	
2	Does the contract or SOW with the subcontractor exist, which defines exact scope of requirements, all deliverables, schedule and cost?	
3	Does the separate Business Requirements Document attached to SOW?	
4	Is SOW prepared by the delivery team and approved by QC review?	
5	In case if scope changes required later in the project, are they reviewed by delivery team and approved by QC review before submitting them to the subcontractor?	
6	Are terms of payments and legal responsibilities thoroughly listed in SOW?	
7	Is the subcontractor project plan and deliverables approved by the delivery Project Manager?	
8	Are there the effective project management and QA processes established and used in the subcontractor organization on all projects?	
9	Has a project scheduling and tracking tool, such as MS Project, Niku, Primavera etc. been used by subcontractor on the project?	
10	Is the subcontractor's PM providing weekly status of the work?	
11	Is the subcontractor project plan updated weekly to reflect the actual hours of the completed tasks and tasks being processed?	
12	Is the weekly subcontractor status meeting scheduled and conducted?	

13	In case of subcontractor issues, are the corrective actions taken, reported and resolved by the assigned deadline?	
14	Are actuals collected, documented and used to determine the subcontract project status at least weekly?	
15	Is the escalation path established and used for the subcontractor issues that can't be resolved by due date?	
Comments:		

Configuration Management (CM) Audit

The Configuration Management Audit Checklist is shown in Table 14-13.

Table 14-13 Configuration Management Audit

Configuration Management Checklist		
Project Name: _____ Date: _____		
PM Name: _____ Client Name: _____		
1	Does the Project Configuration (CM) process exist and mandatory to follow?	
2	Is the responsibility assigned to a person for storage of all intangible deliverables in the special computer library and the tangible deliverables in the special storage?	
3	Do the CM computer library and the CM storage exist?	
4	Is check/uncheck of every deliverable documented in PCB and performed by the authorized personnel in accordance with the CM process?	
5	Are all CM related metrics recorded and available for CM audit?	
6	Is the cost of CM activities is included in the overall project cost?	

Quality Control (QC)

The purpose of QC is verification of the deliverables' compliance to specifications and removal of defects which remain in the finished deliverables. However, if quality is not built into deliverables from day one of the project using Quality Assurance, then it is past the time to speak about the project quality - all that can be done now is to remove obvious defects. Quality Control success will be limited, because it is impossible to remove all defects and some of them will be discovered later – in steady-state use and long after project completion.

Deliverables in the project context are not only those elements of the project which are delivered to clients, but also other “intermediate” project elements, which are required in order to produce client deliverables. Therefore, a deliverable is the product of a project task, which has a completion deadline in the schedule. The following are four standard QC reviews:

1. Business Requirements review
2. Statement of Work (SOW) review
3. Other deliverable documents reviews
4. Peer reviews

QC Review process P2-2 consists of the following:

1. Identify Review Team (P2-2-1)
2. Schedule Review and Invite Participants (P2-2-2)
3. Send Materials to Participants (P2-2-3)
4. Conduct Review / Take Notes (P2-2-4)
5. Update Materials (P2-2-5)
6. Rate QC Review (P2-2-6)
7. Modify Deliverable (P2-2-7)

Business Requirements review has been covered in the Requirements Frame section. In addition to the reviews described above, there are two more QC reviews of deliverables, which will be described in the Closing Frame section of the book:

1. User Acceptance Test Plan Review
2. Project Completion Review

The Table 14-14 shows three types of QC reviews, with a brief description, timing of the review, frequency and more.

Review Type	Verify	Time of Review	QC Team	Frequency
SOW and Initial Risk Assessment	1.All Business Requirements can be met 2.Pricing and Terms of Payment are Appropriate 3.Schedule is achievable 4.Legal Issues has been considered 5. Overall Project risk is low.	Before SOW is delivered to client	PM, Delivery Management, QA Rep, SME	Once
Other Deliverable Docs and Risk Assessments	Each document has different verification criteria specific to the reviewed document.	After document is complete, but before delivery	PM, QA Rep, SME	Once for each deliverable document
Peer Review	1. The reviewed project elements and deliverables conform to specifications. 2. Defects are removed	After project elements are complete, but before delivery	PM, QA Rep, SME, Delivery Team members	Once for each deliverable

Each QC review is performed once for each deliverable, provided the review is successful, but must be repeated if the review fails. Depending on the type of project, there may be additional project documentation produced which require review as well. For example, in some projects, where a proposal was developed, a Proposal Review is required.

Peer review is usually a technical review of specific project deliverables. There may be one peer review of the Project Architecture document, one for High Level Design, one for each module of the detailed design, and so on.

The process of producing project deliverables, such as Business Requirements, the Statement of Work, the High Level Design and others are part of the project management process, examined by the QA Audit, but the actual review of those deliverable documents with the purpose of confirmation and defect removal is a part of the QC process.

Most QC review processes are very similar from the point of view of preparation for review, defects removal and review rating. The document walkthrough, however, is very specific for each project with a different approach for each document and its unique audience. The approach will be established by the Project Manager with the help of the Subject Matter Experts.

QC Reviews are led by the Project Manager or the Subject Matter Expert with the participation of the QA Representative. In addition, a scribe must be assigned to document all discussions and suggestions. The scribe must be sufficiently knowledgeable in subjects discussed at the review.

QC Review Process Flow

A Business Requirements review, which is one of the QC reviews, is conducted when the Conduct Requirements Review (R8) process is executed in the Requirements Frame. Since Requirements Management is a 'mini project' of its own, this quality review has been described earlier and therefore the subject is not repeated in this chapter.

A QC review is triggered when the deliverable is complete and the preceding QA Project Management audit is passed. QC reviews run in accordance with the process flow shown on Fig 14-4.

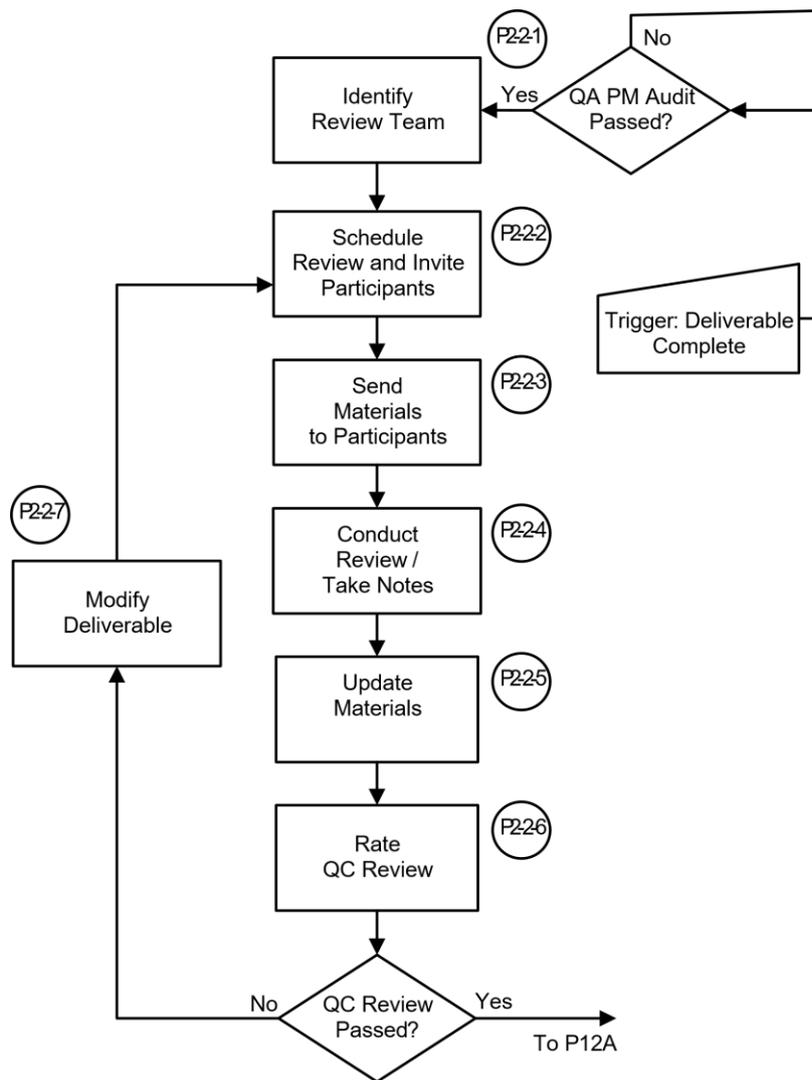


Fig 14-4 Quality Control Review

The process is triggered by completion of a new deliverable document. The prerequisite for a QC review of the deliverable is the QA PM Audit, which confirms that the deliverable has been produced in compliance with the project management process requirements.

Therefore, if the answer to the control point question (QA PM Audit Completed?) is NO, the flow will return to the same control point again and will continue waiting for completion of the PM Audit. Once the answer is YES, the process flow enters the Identify Review Team (P2-2-1) process.

This review should include the QA Analyst, the Project Manager and the relevant delivery team members. Some QC reviews may require presence of the pricing specialist or even a legal adviser. It is the Project Manager’s and QA Analyst’s joint responsibility to identify all relevant people who may contribute to the QC review. The objectives of the review are to document possible defects, omissions and unnecessary elements in the deliverable.

Once all the review team members are identified, they should be listed in a format similar to the one shown in Table 14-15.

Table 14-15 Review Team

#	Name	Role	Area of Expertise	Phone	email
1	A. Thomson	Quality Analyst	Quality Management	Ext. 2000	
2	K. Reid	Sys. Architect	Sys. Architecture	Ext. 2012	
3	M. Ortiz	Sys. Analyst	Sys. Analysis	Ext. 1812	
4	F. Norris	Project Manager	Project Management	Ext. 1948	
6	P. Ricer	Price Analyst	Pricing	Ext. 4290	

The next process is Schedule Review and Invite Participants (P2-2-2), when all the relevant people are invited for review. The review must be scheduled at least seven days in advance, the conference room (or virtual equivalent) booked for review and meeting invitations and agenda sent to participants. If any participant declines invitation, he/she must ensure that a qualified representative is assigned to attend the review. The manager of the participant who declined the invitation must be notified. Without the proper representation, the review must be rescheduled.

Participants will receive materials for review in the process Send Materials to Participants (P2-2-3). All materials related to the review must be sent to participants by electronic or regular mail and received by participants at least one week in advance. Materials include agenda, documents, design and other relevant documentation.

At the designated time and place, the review takes place in accordance with process Conduct Review / Take Notes (P2-2-4), as described below. Notes are recorded, as comments and critiques follow the deliverable presentation to the review team. They usually indicate defects in the deliverable document. Each deliverable should have its own specific review method developed by the subject matter experts. Deliverable documents are often reviewed page-by-page. Defects or omissions are documented. Peer Review of the architecture and design usually starts with presentation by the author of design and followed by questions. Notes are taken by Project Manager, QA Analyst or a scribe, who must understand the subjects discussed and be able to document discovered defects and the required modification in a professional way. A person who takes notes should not normally lead the review or actively participate in discussion, in order to have ample time (and focus) to concentrate on documenting all details of the review.

When all required modifications and fixes are identified, the Project Manager must obtain consent from the review team by sending notes with the requested modification and fixes to all review team members. This will ensure that the review notes are correctly recorded and that only the required modifications and fixes will be made. The review activity should be documented in the PCB, including the date and attendees, the agenda, the results of the review and required modifications.

After the review takes place and notes taken, defects will be removed and materials updated in the Update Materials (P2-2-5) process, according to notes taken during the review. The author of the deliverable must make all of the required updates and send the completed deliverable to the PM and the QA Analyst. Both must verify that no additional issues are left open.

The updated deliverable will be rated PASS or FAIL in the process Rate QC Review (P2-2-6) by the QA Representative. The QC Review will be rated after the review materials have been updated and no issues are left open. Also, the QA PM Audit, which immediately precedes this QC Review, must have a grade of PASS. If this is indeed the case, the rating is PASS. If not all QC issues are resolved, the review must be repeated. The QA Representative must present a full list of all issues remaining to the Project Manager for any follow-up modifications. The QA Representative must forward the QC Review results to the Project Manager and the Delivery Manager.

If the QC Review passed, then the answer to the control point question (QC Review Passed?) will be YES and the QC review is complete. If the answer is NO, the delivery team will continue working on the deliverable, until all issues are closed in the process Modify Deliverable (P2-2-7) and the process flow returns back to P2-2-2 to repeat the entire process again.

Quality Management Plan

The Quality Management Plan is the guidance on “building-in quality” through implementation of Quality Assurance audits, Quality Control reviews, quality reporting and the schedule of implementation. Much of the Quality Management Plan consists of the quality approach and QA/QC activities built into the existing project plan. The Quality Management plan includes the following topics:

- Quality objectives
- Quality Assurance and Quality Control processes
- Established schedule and frequency of Quality Assurance Audits
- Schedule of Quality Control reviews, tied to project deliverables
- Quality Management roles and responsibilities
- Quality checklists
- Reporting quality issues

It may not be necessary to have a Quality Management Plan as a separate document, because the entire plan topics which have been already laid out in the Quality Management’s processes and checklists must be documented in the quality section of the PCB. The schedule of specific QA and QC tasks should have been embedded into the existing project plan. The quality status must be reported to senior delivery management (on a monthly basis at a minimum) in the quality section of the project status report. Quality Management responsibilities have also been described in the above chapters and documented in PCB.

Quality Management Metrics

The following quality metrics must be collected and documented:

1. Total number of scheduled QA audits in the Project Plan
2. Total number of conducted QA audits from the list of the scheduled audits
3. Total number of earlier unplanned emergency QA audits
4. Number of planned QA audits passed the first time
5. Number of planned QA audits passed the second time
6. Number of planned QA audits escalated
7. Number of emergency QA audits passed the first time

8. Number of emergency QA audits passed the second time
 9. Number of emergency QA audits escalated
 10. Total number of identified in the Project Plan deliverables
 11. Total number of completed deliverables
 12. Total number of QC reviews
 13. Total number of passed QC reviews
 14. Total number of failed QC reviews
-

About the Author



Dan Epstein

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Dan Epstein combines over 25 years of experience in the project management field and the best practices area, working for several major Canadian and U.S. corporations, as well as 4 years teaching university students project management and several software engineering subjects. He received a master's degree in electrical engineering from the LITMO University in Leningrad (today St. Petersburg, Russia) in 1970, was certified as a Professional Engineer in 1983 by the Canadian Association of Professional Engineers – Ontario, and earned a master's certificate in project management from George Washington University in 2000 and the Project Management Professional (PMP®) certification from the Project Management Institute (PMI®) in 2001.

Throughout his career, Dan managed multiple complex interdependent projects and programs, traveling extensively worldwide. He possesses multi-industry business analysis, process reengineering, best practices, professional training development and technical background in a wide array of technologies. In 2004 Dan was a keynote speaker and educator at the PMI-sponsored International Project Management Symposium in Central Asia. He published several articles and gave published interviews on several occasions. In the summer of 2008 he published "Methodology for Project Managers Education" in a university journal. His book, *Project Workflow Management - The Business Process Approach*, written in cooperation with Rich Maltzman, was published in 2014 by J. Ross Publishing.

Dan first started development of the Project Management Workflow in 2003, and it was used in a project management training course. Later this early version of the methodology was used for teaching project management classes at universities in the 2003–2005 school years. Later on, working in the best practices area, the author entertained the idea of presenting project management as a single multithreaded business workflow. In 2007–2008 the idea was further refined when teaching the project management class at a university. Since 2009, Dan has continued working full time in Project Management. Dan can be contacted at dan@pm-workflow.com.

To see other works by Dan Epstein, visit his author showcase in the PM World Library at <https://pmworldlibrary.net/authors/dan-epstein/>