

## APPRAISAL OF THE NECESSITY OF QUALITY MANAGEMENT PLAN (QMP) TO BUILDING AND CIVIL-ENGINEERING PROJECTS

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### ABSTRACT

The Construction Industry in Nigeria is still not well structured and regulated to enforce quality in all facets of project implementation. This paper highlights the importance of quality management plan as a key factor leading to successful implementation of a building/construction design and implementation in terms of functionality, aesthetics and stability; line with the provisions of the National Building Code. A construction/building firm must organise itself in such a way that human, material, equipment, administrative and technical factors affecting the quality of a project will be under control at all times. The client, designers (architects, engineers etc. and builders (constructors)) have important roles in a process of quality management and assurance. An effective Quality management plan leads to owner and user satisfaction, increased productivity, efficiency, higher profitability and increased competitiveness. Examples of how a good quality management plan is developed are stressed in the paper.

**Key Words:** deliverables, templates, user guides, expert review, peer review, multi- person review, walk-through, process review, measurability, controllability, reportability

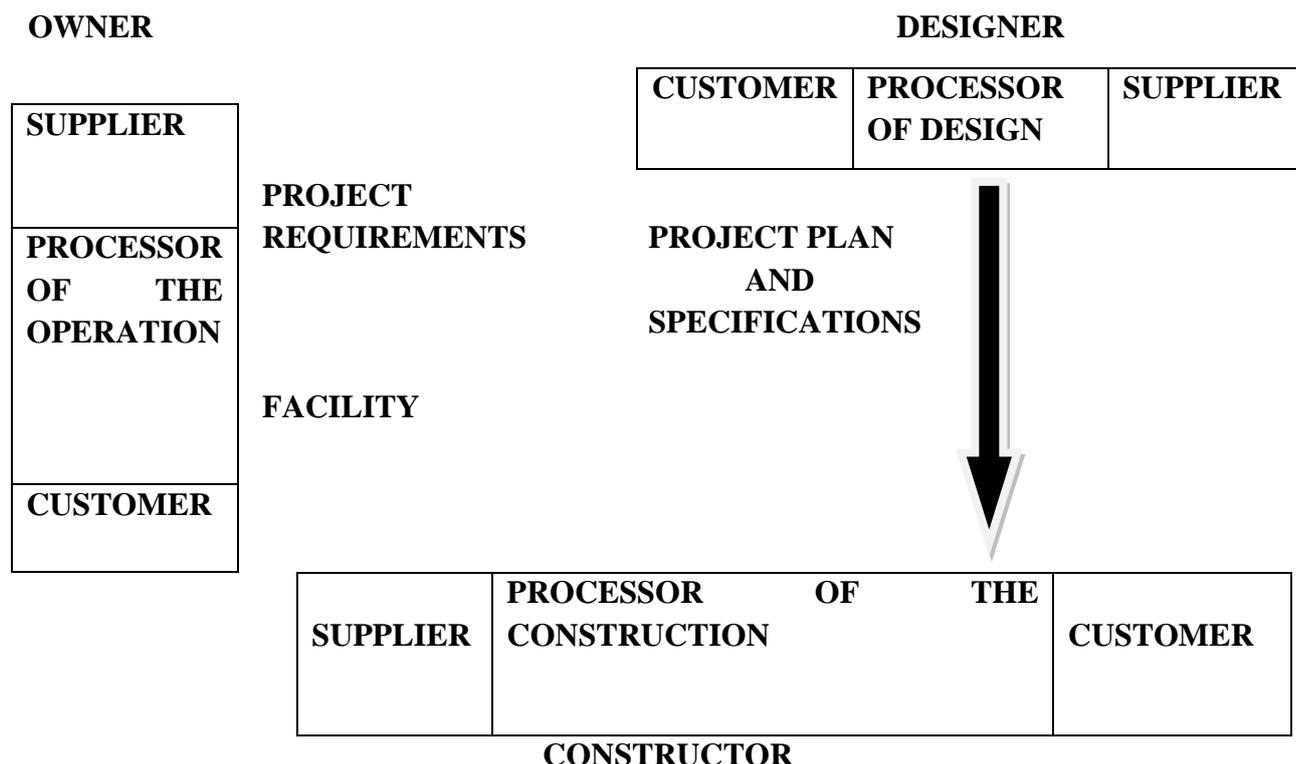
### Introduction

The Nigerian National Building Code (2006), under Section 2.32 c stipulates that, construction programme, project quality management plan and project health and safety plan prepared by a registered builder. The Code did not go beyond this statement. According to Gasparik (2002), construction needs must be defined by the client. The inclusion of services is pertinent to construction where both designers and contractors supply services as well as the finished product. Szalayova (2002), the quality of these services is essential, not only in meeting the clients' requirements but also in keeping to time and budget, aesthetics and functionality as earlier mentioned, for a building/construction organisation to be truly efficient.

Bamisile (2004) stressed the need for the development of quality standards for design and construction according to clients brief. The quality at the design phase is seen as a key factor every single part of it must work in synergy. Every part, every activity, every person in a

building/construction company affects and is in turn affected by others (suppliers, subcontractors e.t.c). (Gasparik et al in communicating the clients’ requirements to the constructor (builder). Quality management (QM) cuts across materials manufacture design, workmanship and implementation at the construction stage of a building/construction project.

Applying the Triple Role System (Juran, 1990) which defines every part in a process as having three distinct roles to play: supplier, constructor (processor) and owner (customer, client); this process is applicable to the building/construction. The process is illustrated in figure 1 below.



**Figure 1: Juran’s Triple Role Concept applied to Building/Construction**

According to Juran’s Concept (1990), the client, designer and constructor (builder), each have the three roles to play. That is; Customers which can be internal or external. Internal customer is from within the building and construction organisations (Julius Berger requesting services from a local quarry). Internal customers receive products and information from other groups or individuals within their organisation, satisfying the needs of these internal customers is an essential part of the process of supplying the ultimate external customer with a quality product. External customer is not part of the company producing the product or service, but is impacted by the product or service. For example, a designer is a customer of an owner’s requirements. His products are plans and specifications and the customers are the construction firms and the client. For construction, the products are the completed facility and the customer is the final user of the product.

## Importance of Quality Management Plan (QMP)

According to ISO 9000: 2000, Quality Management Plan or System (QMP/QMS) is management plan/system to direct and control an organisation with regard to quality (of a product). The objective of QMP is to ensure project quality plans are developed for projects. Plans should establish a balance between “the quality of the project” and “the quality of deliverables” (Australian society for Simulation in health care, 2005).

QMP is important and obligatory according to the NNC (2006) in ensuring that:

1. Every project should have a project Quality Management Plan.
2. Quality management Plan (QMP) establishes a framework for developing project quality plans.
3. Quality Management Plan (QMP) defines how and when “Quality Events” and “Quality Materials” are applied to a project.

## Developing Project Quality Plans

### Planning Quality

A quality plan needs to cover a number of elements inclusive of the elements that need to go through a quality check such as:

- A. Deliverables:** any significant deliverables from a project should undergo some form of quality check carried out.
- B.** Deliverables need to be prioritised in the context of carrying out quality checks for instance;
  1. A requirements document can be considered significant whereas
  2. A memo or weekly report may not be significant.
- C.** For the project itself, it may be appropriate to have the project management practices reviewed for quality once the project is initially established. This may be useful to give the monitoring team confidence in the construction team.
- D.** When considering what needs to be checked, you also need to differentiate between correct and well constructed or engineered. (A well constructed/engineered bridge may never fall down. If it doesn't cross the river at the right place, it is not correct).
- E.** Quality checking should be for both well engineered and correct construction.

### Appropriate way to check for Quality

The most appropriate way to check for quality is to think backwards. If the end result is that a particular deliverable should meet a standard then part of the quality checking should focus on compliance with the standard. This would indicate a standard audit approach. The following are ways in which to carry out a standard quality audit:

1. Check for quality of deliverable or material prior to the completion of delivery.

2. If there are long development lead times for a deliverable, it might be sensible to hold earlier quality check.

### Those to be involved in Quality Checks

The following person(s) are to be involved in quality check of deliverables:

1. The producers of the deliverables
2. It is also useful to have some representation from the recipients of the deliverable in order to ensure that the deliveries meet their needs.

### Quality Management Planning (QMP) Framework

#### Quality Materials and Workmanship Check

The following format may be used in checking for the quality of construction materials

Materials to be checked	Description
Standards covering such materials:	Standards are instruction and Workmanship documents that detail how a particular aspect of the project must be undertaken. There can be no deviation from “Standards” unless a formal variation process is undertaken and approval granted.
Guidelines:	Guidelines are intended to guide a project rather than dictate how it must be undertaken. Variations do not require formal approval.
Checklists:	Checklists are lists that can be used as a prompt when undertaking a particular activity. They tend to be accumulated wisdom from many projects.
Templates:	Templates are blank documents to be used in particular stages of a project. They will usually contain some examples and instructions.
Procedures:	Procedures outline the steps that should be undertaken in a particular area of a project such as managing risks or managing time.

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Process:	A Process is a description of how something works. It is different to a Procedure in that a Procedure is a list of steps; i.e. what and when. A process contains explanations of why and how.
User Guides:	User Guides provide the theory, principles and detailed instructions as to how to apply the procedures to the project. They contain such information as definitions, reasons for undertaking the steps in the procedure and roles and responsibilities. They also have example templates.
Example Documents:	These are examples from prior projects that are good indicators of the type of information and level of detail that is required in the completed document.
Methodology:	A Methodology is a collection of processes, procedures, templates and tools to guide a team through the project in a manner suitable for the organisation.

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### Quality Procedures

The following Quality procedures are typically used to review the quality of deliverables. They tend to have a different mix of reviewing the structure and reviewing the content.

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### Materials and works to be checked Description

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Expert Review:	Review of a deliverable by a person who is considered an expert in area. The person may not currently hold a position but has expert knowledge in the area. This type of review is good when the focus is on accuracy of content (correct) rather than of structure (well-Engineered).
Peer Review:	Review of deliverables by one's peers. Peers reviews are better suited where the emphasis is on structure rather than content. A peer review will focus on ensuring the deliverable is well engineering. Neither an "Expert Review" nor a "Peer Review" is exclusively focused on content or structure. They each however, have a different emphasis.

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Multi person Review:	<p>A review carried out independently by several people is likely to pick up more points however it does bring the difficulty of trying to reconcile different viewpoints. It is best undertaken when the purpose is to gain agreement between different stakeholders.</p> <p>Time should be allowed to reach agreement of conflicting opinions. This may entail a meeting or workshop to resolve differences.</p>
Walk-through:	<p>A walk-through is a useful technique to validate both the content and structure of a deliverable. Materials should be circulated in advance. If participants have not done their homework, they should be excluded from the walk-through.</p>
Formal Inspection:	<p>A formal inspection is a review of a deliverable by an inspector who would typically be external to the project Team. The inspector captures statistics on suspected defects. It is a useful technique for use with documentation.</p>
Standard Audit:	<p>A standard Audit is carried out by a person who is only focused on ensuring the deliverable meets a particular standard(s).</p>
Process Review:	<p>Where process is reviewed to ensure all necessary actions are being undertaken, information recorded, and procedures followed. A process Review is useful to validate the existing processes in an organization; for examples, modification to an existing system may be based on the assumption an existing business process is being followed. If the business process is either not being followed or is different, the modification to the system may have unexpected results.</p>

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### Quality Metrics

Adding Quality Metrics to a project Quality plan are moves subjective assessment during Quality Assurance.

A metric is a verifiable measure stated in either quantitative or qualitative terms; for example,

1. 95 percent accuracy;
2. As evaluated by our clients, we are providing above-average service;
3. Delivered within 7 days of authorisation;

Metrics must have the following characteristics:

Characteristic	Description
Clarity of Definition:	Because the metric is intended to convey a particular piece of information regarding an aspect of business performance in a summarized manner, it is critical that its underlying definition be stated in a way that clearly explains what is being measured. Each metric should be subject to an assessment process in which the key project stakeholders participate in its definition and agree to the definition's final wording.
Measurability:	Any metric must be measurable and should be qualifiable within a discrete range.
Controllability:	Any measurable characteristics of information that is suitable as a metric should reflect some controllable aspect of the project.
Report ability:	Each metric's definition should provide enough information that can be summarized as a line item in a report.

## Continuous Improvement on QMP

### Step-by-step Improvement

What goes wrong in one project is likely to go wrong in other projects unless the cause is identified and fixed. Continuous improvement is defined as the progressive step-by-step improvement of all aspects of the organization and its resources. Steps may often be small; however, they can achieve significant impact by the sheer weight of accumulation. Practical examples of Continuous Improvement include:

1. If a template is missing a heading, don't just fix the project document, fix the template.
2. If projects continually fail to meet a standard, either change the standard or fix the cause.
3. If there are no generally accepted availability criteria for business applications, don't just add some to your requirements. Get them published as corporate criteria.

## Continuous Improvement Framework

Cycle Stage	Description
Plan:	Identify an opportunity and plan for change.
Do:	Implement the change on a small scale.
Check:	Use data to analyse the results of the change and determine whether it made a difference. Act if the change was successful, implement it on a wider scale and continuously assess your results. If the change did not work, begin the cycle again.

## Conclusion

Quality management plan or system begins with commitment from the client and organisational management in form of a quality policy. The implementation of the full quality plan then needs to be planned and monitored to ensure its effectiveness. The International Standards Organisation (ISO) 9000:2000 Series sets out the methods by which a management plan incorporating all the activities associated with quality can be implemented in a building firm/organisation to ensure that all specified performance requirements and needs of the client are fully met. The Client, designers and builders have important roles in a process of quality management and improvement. The aim of good QMP is to provide the operator with consistency and satisfaction in terms of methods, materials and equipment. An effective QMP leads to client satisfaction, increased productivity, efficiency, higher profitability and increased competitiveness.

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### Appendix 1: Example Project Quality Plan

A typical Project Quality Plan may look something like this

Deliverable	Quality Event	Quality Materials	Quality Metrics	Purpose
Preliminary Business Case	Expert review	Business Case template	All elements of the template have been completed	Ensure the information is accurate and well constructed prior to submission to project Board
Final Business Case	Formal Inspection by Sponsor	Requirements Business Case template	Approval by the Project Board	Ensure the Business Case in a fit state to be submitted to the Finance Review Committee.
Project Management Plan	Walk-through of early draft	Project Management plan template	All elements of the template have been completed	Review early draft for completeness.
	Peer Review of final draft	Project Management plan template	All elements of the template have been completed. Project Schedule achieves contracted timelines	Review final draft completeness and construction
Programme Design	Expert Review of Programme Design	Programme Guidelines Programme Objectives Previous Programme Design Examples	Design is meets all programme Guideline Design achieves programme objectives	Compliance with guideline, requirements and general accuracy
	Formal Inspection by Sponsor	Programme Guidelines Programme Objectives	Design was delivered in accordance with the project Schedule Design meets all Programme Guideline Design achieves Programme Objectives	Compliance with contract terms