Importance, Roles and Responsibilities of Document Controller in Indian Construction Industry

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Abstract

In Indian construction industry, Document Controller work is considered to be insignificance and thus many companies work without professional DC and finally struggle with document managing and retrieval. Without DC, the employees waste around 15-20% of their time in searching for the right updated latest document. Hence, Document control in itself is a vital practice to be followed in all the construction projects whether its low, medium or high-level project to ensure that information is accurate, latest, timely & transparently available within the ambient of the project to all the associated stakeholders.

As per definition, Document control is all about following a pre-set policies and procedure defined in Project Execution Plan (PEP) and these steps are practically followed by a document controller. Document controller works throughout the project lifecycle. To be specific, DC is always undervalued and has not received the attention it deserves but DC always come to rescue when the Project Manager or Sr. Management is looking for any specific critical documentation either received or sent to the client or to any other stakeholders.

The study is to highlight the importance of DC which includes roles and responsibilities carried out by DC. Questionnaire survey was prepared, and inputs taken from industry experts to analysis the results. Research aims and objective is to find the issues related to DC and to find answers to 04 questions raised in Questionnaire survey which limit the scope of the study, where-in questionnaire survey can include more specify questions to bring out various responsibilities carried out by DC.

Study shows that Document controller is the one who during initiation of the project set up a robust document management system like Projectwise or Aconex or any other company internal documentation system and support the project till closure.

Keywords:

Document Controller, Document Control, Indian Construction Industry, ISO, Aconex, Projectwise

I. Introduction

In today's world, where construction projects are becoming more and more complex, the need for documentation has also increased rapidly. Document Control has become a very critical activity.

There are various construction documents needs to be prepared at the initiation stage of the project. Documentation can be divided into two critical types of documentation: (Hodgson, n.d.)

1. ***Site Documentation*** – All the documents (majorly Drawings and Reports) which forms the site information management system.

2. ***Project Documentation*** – All the documents to be submitted as per contract to the client before starring of the work like: (Young, 2018)

a. Priced Bill of Quantities
b. Construction Programme
c. Project Quality Management Plan
d. Project Health and Safety Plan
e. Communication Management Plan.
f. Procurement Management Plan.
g. Change control Register.
h. Contract agreement including all initial drawings and technical specifications

i. Risk Management Plan
j. Project insurance Documents
k. Miscellaneous Documents
l. Audit Reports.
m. Summary status of all the Documents

All these documents are managed and stored by DC.

As per the spike cavell survey, around 57% project fails due to poor communication (Hasan, 2016). Document controller considered to be the king of all official communication between all the stakeholders. To save the project, company needs to establish proper "Project Management Information System (PMIS)" from the starting.

Documentation is considered to be so critical that even a saying about it: If it wasn't documented, it wasn't done (Construction, 2021)

Apart from this as discussed above the site documentation holds very important place and these documentations needs to record by Document Controller and kept for later use in the project when the necessity of the same arises. Site Documentation includes the following: (Construction, 2021)

a) RFI's (Request for Inspection) for each and every item which is required to be signed by the client and hard copy of the same needs to be recorded by the document controller in this filing.
b) All the change orders.
c) All the permits for the works done every single day.
d) Daily/ Weekly/ Monthly reports.
e) Equipment Logbooks.
f) All Minutes of Meetings (MoM) held at site.
g) Incoming and Outgoing Documents.
h) Summary status of all the Documents.
i) All Subcontractor/ Subconsultant contracts.

In a Design Engineering firm, DC mainly handles the following documents:

1. Preliminary Design and Drawings
2. Detailed Design and Drawings
3. Construction Reference Drawings (CRD)
4. As-Built Drawings.

II.   Literature Review

Document Controller work is essential preventive measure for the project to ensure that all the related stakeholders use approved & latest documentation throughout the project life cycle. Thus, preventing inadvertent use of the superseded drawings/ designs by the site team. (IANZ, 2021)

Responsibilities of Document Controller: (Toolkit, n.d.)

i. Create Template for better documentation to be used by entire project team.
ii. File document in both physical and digital form.
iii. Copy, scan and store documents.
iv. Check for accuracy of the edited/revised files by the project team before sending to the client/ approving authority.
v. Review and update documentation records.
vi. Act as a communicator between various stakeholders and distribute the latest files to both internal and external teams.
vii. Retrieve data as and when requested by the project team. Thus, making traceability of documents easier.
viii. Manage the flow of documentation within the organization.
ix. Secure all the documents and maintain confidentially around the sensitive information.
x. Helps in improving document control procedures in the organization.
xi. Helps in project audit.

Major skills required by Document controller for successful working in any organization and on any project: (Construct, n.d.)

I. DC should have excellent organizing skills as they keep on receiving a lot of data from various departments on daily basis.
II. DC should be familiar with the electronic documentation system which means DC should possess the knowledge on working on the various software like
a. *Bentley Projectwise 365* – All in one control of project data including contractual documents & conveniently create, share, review and collaborate on projects with project teams working across the globe in the cloud.

b.   *Oracle Aconex* – Cloud based operation management solution for managing documentation between various parties/ stakeholders on complex construction & Engineering projects.

c.   *Microsoft OneDrive* – it is an online document/file storage and sharing platform.

d.   *Microsoft Sharepoint* – One can setup a sharePoint for each project along with the dashboard where all the documents can be stored for accessible by the project team anytime and from anywhere, and so on.

III.   DC should possess the skills of working in a team as DC will need to interact with different departments and work with them in a cohesive environment to maintain the documentation of each discipline in a proper agreed/ prescribed manner.

IV.   DC should have Hands-on experience on advance use of MS Office and MS Excel.

V.   DC should familiarize with the project management methodologies, tools and techniques.

VI.   DC should hold a good knowledge of English language as all the communication will happen in English only.

VII.   Working under Project Controls department, DC should help planning engineer in providing the summary status of the required information.

Thus, overall DC helps in reducing errors in documentation which in turn fast process the system and increase the productivity of the project team. DC also helps in automation flow of data within the project.

Objective of this research article:

The aim is to bring out the issues faced due to poor documentation & no Document Controller on the project.

Objective of this study is to find answers (Yes or No) to below questions using questionnaire survey:

HR1: Importance of Document Controller in managing the proper flow of documents.

HR2: Document Controller helps in easy retrieval of documents as and when needed.

HR3: Document Controller helps in document version control.

HR4: Document Controller digitalized all the documents on the server which is accessible to all.

Document Control is a part of Quality Management System (QMS) and ISO 9001:2015 which mandates "control over documented information" for the following reasons:

a)   To guarantee that the correct people have access to a required information where and when they need it and

b)   To ensure that no unauthorized changes can be made to its required contents and the data should be adequately protected. (Byrne, n.d.)

III.   Research Methodology

Quantitative research methodology employed as for the study. Both primary and secondary data was collected and analyzed for reaching to the conclusion of the research. A questionnaire survey was prepared and circulated to industry experts to answer the 04 questions raised in the survey. All the data was collected through email.

Questionnaire survey was circulated to contractor, consultancy, client, sub-contractor and sub-consultancy companies. Respondents include field experts having a quite significant years of experience in their respective fields.

Total of 230 respondents were targeted. Collection of data took over a period of 1-2 months and data analysis was carried out for another few days.

The author is familiar with the Indian Construction Industry and having a large experience in the field of planning and project management. Author understands the underline issues faced during deployment of the planning engineer for any project. Hence, questionnaire survey was the best method to be adopted for research. Further, the respondents considered for this research have significant years of experience in handling construction projects, coming from different hierarchy (High, Medium & Low) of various organizations i.e. planning manager, site team, construction managers, project managers, project controls manager & sr. management and organizations like contractor, consultant, client and sub-contractor/sub-consultant respectively. To make the research more effect only medium and large organizations are targeted for the survey. (Preston, 2009)

Quantitative research is deployed to measure the data accurately. It is an objective and easy way to collect the data. This research methodology uncovers the measurable in terms of values and percentages to formulate a theory and fact which uncovers/ depicts a pattern. Data collection method like questionnaire survey are highly structured way of collecting and analyzing the data. Sample population used to collect data represent the entire Indian construction industry. Finally, research questions interlinking can be justified using hypothesis. A hypothesis is a statement that that introduces a research question and proposes an expected result. Here, relational hypothesis is used to determine if relationships exist between a set of variables. (KENTON, 2020)

The questionnaire was developed based on the criteria carried from literature review and with experts' conversation. Semi structured interviews were also conducted with industry experts to make questionnaire more

relevant to the research objective and to understand the basis cause of failing project management process as a whole.
Simple random sampling method is used for data collection and analysis.

IV.   Data Analysis and Results

As per the survey and semi-structured interviews, Participants identified seven issues as the biggest problems faced due to poor documentation & no Document Controller on the project. (Software, 2022)

Sr. No.	Issues raised by the respondents	Responses in %	Total Responses
I1	Decrease in productivity & increase in Employee frustration	23%	
I2	Difficulty keeping track of document revisions	18%	
I3	Increase in rework	17%	
I4	No proper follow-up on the project documentations like Professional Insurances, warranties, Bank Guarantees and so on	15%	230
I5	Delay in communication between stakeholders	14%	
I6	Accessibility challenges	08%	
I7	Leakage of important information to third party	05%	

Table 1:Issues raised by the respondent

The result from the above table shows that overall documentation suffers without Document Controller and the whole project suffers without the proper documentation.
To cross verify, Relative Importance Index (RII) is deployed to determine the relative importance of the factors highlighted by the respondents. (Harsh Saxena, 2018)
Weightage range from 1 to 5 where,
A = the highest weightage i.e. 5
N = total number of respondents
W = Weighting as assigned on Likert's scale by each respondent in a range from 1 to 5 where,
1 = Least importance
2 = Low Importance
3 = Medium Importance
4 = High Importance
5 = Extremely Significance
RII value will range between 0 and 1, the higher the RII value the more important delay factors highlighted by the respondents.
Following formula is used for calculating the RII:

$$RII = \frac{\Sigma W}{A \times N}$$

Issues raised by the respondents	Extremely Significance	High Importance	Medium Importance	Low Importance	Least importance	Total responses	Frequency
	5	4	3	2	1		
I1	75	60	50	25	20	230	F1
I2	74	61	48	23	24	230	F2
I3	72	60	51	24	23	230	F3
I4	71	59	48	30	22	230	F4
I5	71	60	47	27	25	230	F5
I6	69	60	50	26	25	230	F6
I7	68	60	50	28	24	230	F7

Table 2:Frequency Table (Response Table)

| Issues raised by the respondents	ΣW = 5*F1+4*F1+3*F1+2*F1+1*F1	A*N = 7*140=700	RII	Rank
I1	835	1610	0.519	1

I2	828	1610	0.514	2
I3	824	1610	0.512	3
I4	817	1610	0.507	4
I5	815	1610	0.506	5
I6	812	1610	0.504	6
I7	810	1610	0.503	7

Table 3:RII and Rank Table

Hence, cross verified using RII and ranking method.

DC role is equally important for all the organizations whether it's a contractor or consultancy or a client company. Project Controls department highlights the importance of DC while preparing the claims and Extension of Time (EoT) as all the historical data from initiation to completion is readily available with DC all the time. (Gaur, Research Article on Hurdles faced during implementation of Project Controls in Indian Construction Industry, 2021)

The results of respondents can be seen in the form of pie chart below:
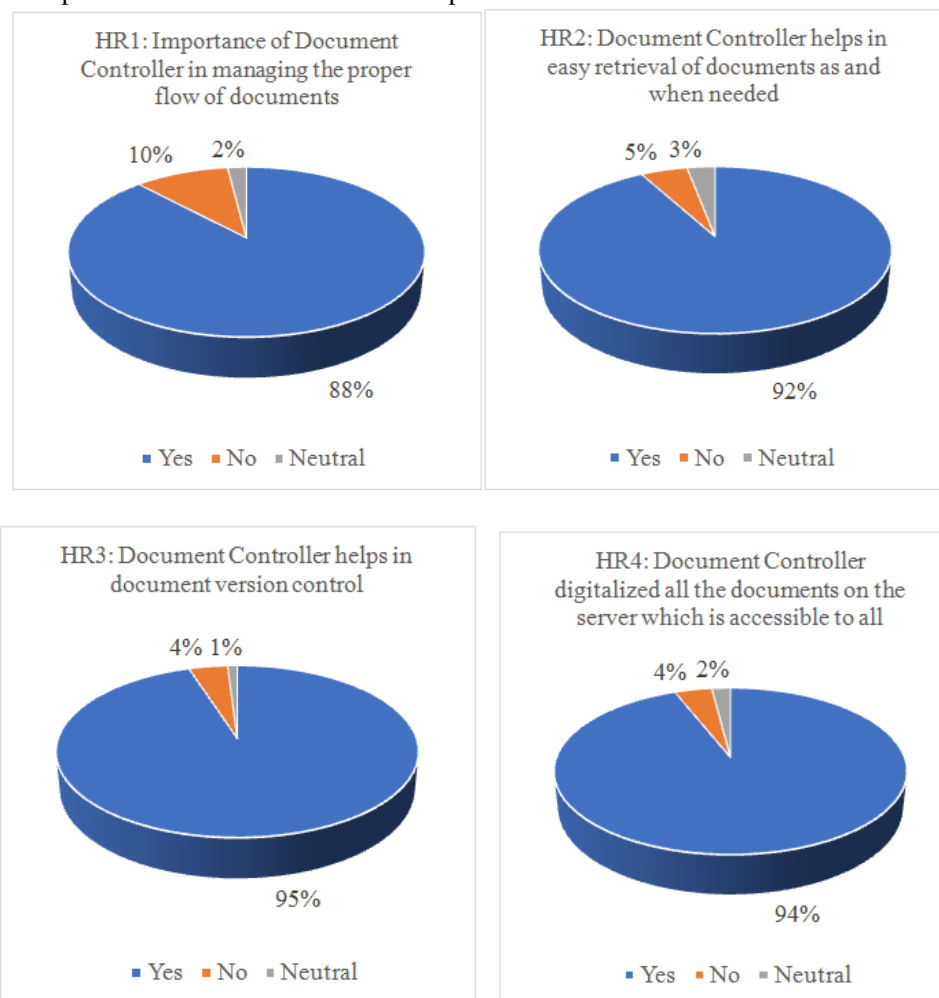
Cross examination of the responses was carried out and it was found that there was nearly no statistical difference between all the set of responses by various respondents from different companies.

Following are the responses in "YES":

Questionnaire Survey questions	Response from Contractor company	Response from Consultant company	Response from Client company	Response from sub-contractor/sub-consultant company	% Response to Research Questions

Weightage as per percentage response	0.5	0.3	0.1	0.1	Formula: ∑ (Weightage X HR)
HR1: Importance of Document Controller in managing the proper flow of documents	89%	88%	90%	85%	**88%**
HR2: Document Controller helps in easy retrieval of documents as and when needed	92%	92%	94%	89%	**92%**
HR3: Document Controller helps in document version control	96%	95%	94%	91%	**95%**
HR4: Document Controller digitalized all the documents on the server which is accessible to all	95%	95%	94%	90%	**94%**

Table 4: Response calculation using weightage

V. Discussion

Even in the pandemic situation, DC manage to organize and update all the required documents with the help of Electronic Document Management System i.e. through digitalization of the documentation.

Apart from this, DC should possess at least education upto the graduation level and should attain certification on International Standards including ISO 9001: 2015 dedicated to Quality Management Systems (QMS) (ASQ, n.d.). On software side, DC should have good knowledge on the usage of various Enterprise Document Management System (EDMS) and know the advance level usage of MS Office and MS Excel.

For working in construction projects, DC should also understand the type of documents and their importance in the project like As Built drawings including Red marking, Transmittals understanding, reviewing of various items in a drawing before releasing it to the approving authority like company's logo, revision number, drawing number, signature of the authorized personnel, company's stamping, Transmittal number, approving coding status like Code - A, B, C or D as specified in the signed contract agreement. DC should also know how many copies are required to be produced for each set of drawings & reports and number of sets to be forwarded to each stakeholder as specified in the signed contract agreement. (Gaur, Understanding the Importance of Project Planning and Scheduling in Indian Construction Projects, 2022)

With the responses of the participants, the importance of DC is widely visible in an organization.

Sample of how CRS is prepared by DC:

| Comments Resolution Sheet (CRS)							
Reviewed Document Data		CRS Data					
Transmittal / Document Ref.		CRS Identification:			Revision:		
Transmittal / Document Title		Status Code:					A
Document Type		CRS Generated by					
Discipline(s) involved		CRS Prepared by					
Location		CRS Approved			Sign		
Transmittal received date		CRS Vetted by			Sign		
Reference:							
Status codes: A: Notice to Proceed - Work can proceed. B: Notice to Proceed but with comments - Revise and resubmit. Work may proceed subject to incorporation of comments. C: Objection - Revise and resubmit. D: Rejected E: Review not required. Work may proceed							
Sr. No.	Doc/Section/ Page	Employer's Representative/ Employer's Personnel Comments	Comment made by	Initial Status	Contractor's Response	Responded By	Revised Status

Table 5: Sample of Comments Resolution Sheet prepared by Document Controller

Sample on how Transmittal is prepared by DC:

Document Transmittal								
Company's Logo					Company's Name			
To:								
Attention :								
Project:				*Transmittal number:*			Sheet	
							No-	
Component:				Day				
				Month				
				Year				
Sr. No.	Document/Drawing No.						Revision	
1								
Medium of Drawings:					*Size*	Number of Copies		
Printed Paper		Tracing			A1			
					A2			
Elect-Copy		Photocopy			A3			
Purpose of Issuance:								
FI - For Information		FA - For Approval			FR – For Record			
FT - For Tender		FC - For Construction			P - Preliminary			
FR – For Review		AB - As Built			R – Replacement			
Remarks:								
Issued by:				Date:				

Table 6: Sample Transmittal prepared by DC

Flowchart of Document and depicting the work of Document controller:(Gaur, https://tbjam.org/, 2022)
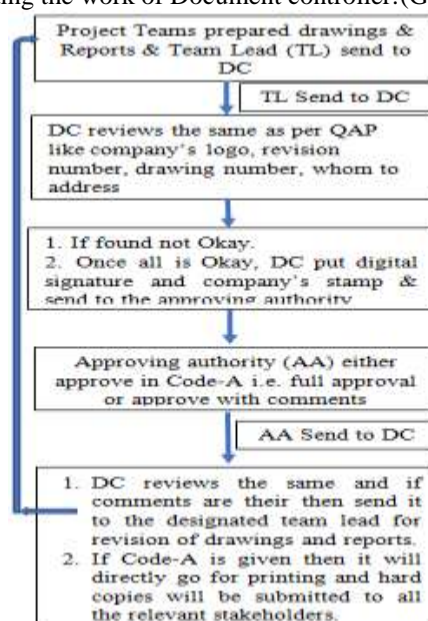
VI. Conclusion

Document Controller (DC) importance is rightly highlighted in this research article. Document Controller not only archive documents but also coordinate with the various project teams for better document

flow among internal organization and external too including client, sub-contractors, vendors and so on. Document Controller among other works also help in bid packages preparation and purchase orders.

As per definition, Document control is all about following a pre-set policies and procedure defined in Project Execution Plan (PEP) which is intended for the following:

1. Document Creation,
2. Document Numbering,
3. Documents Review as per standard company QAP (Quality Assurance Plan),
4. Document Release to the required stakeholders,
5. Document made accessible to all as per communication plan,
6. Document Tracking,
7. Document filing of hard copies, if required,
8. Document Storage in the form of soft copy on the designed server,
9. Document Protection and Security,
10. Document retrieval and
11. Disposal of superseded documents.

All these steps are practically followed by a document controller in compliance with the company's internal rules and regulations.

Hence, we can say that document controller is responsible for preparing and managing all the incoming and outgoing documents in a timely and efficient manner within the boundary of the construction project where role of DC is assigned.

DC by maintaining the documentation helps in increasing the productivity of the associated project teams and reduces document breach by unauthorized personnel.

DC is also given the responsibility of the Audit though supported by Project Controls team. Nevertheless, all the submitted drawings and reports by the project team is bound to revise and DC is responsible for providing the new revision number to the document as per the pre-agreed document numbering policy with the client.

Finally, it can be said the in-construction sector for every department, DC control some or the other documents like for Health safety and QA department – Document Controller manages all Work Inspection Request (WIR), Materials Inspection Request (MIR), Nonconformity Report (NCR), Accident / Incident Reports and so on. (JOEVILGAS2, 2018)

Document control is a life support of the project and DC acts as a ventilator to that life support. Hence, Document Controller should be given due respect and should be treated as an important part of the project team. For better functioning of Document Controller, Project Controls department should be created, and Document Controller should work under Planning Manager for better coordination of the project.

References

[1]. ASQ. (n.d.). https://asq.org/. Retrieved June 09, 2022, from ASQ: https://asq.org/quality-resources/iso-9001
[2]. Byrne, J. (n.d.). https://www.cognidox.com/. Retrieved June 07, 2022, from Cognidox: https://www.cognidox.com/blog/document-control-iso-90012015
[3]. Construct. (n.d.). https://www.goconstruct.org/. Retrieved June 06, 2022, from Go Construct: https://www.goconstruct.org/construction-careers/what-jobs-are-right-for-me/document-controller/#:~:text=Document%20controllers%20maintain%20project%20documents,documents%20like%20blueprints%20and%20reports.
[4]. Construction, P. (2021, September 14). https://perlo.biz/. Retrieved June 05, 2022, from Perlo Construction: https://perlo.biz/the-importance-of-project-documentation-in-construction/
[5]. Gaur, S. (2021). Research Article on Hurdles faced during implementation of Project Controls in Indian Construction Industry. International Journal of Scientific and Research Publications, 11(12), 223-231.
[6]. Gaur, S. (2022). https://tbjam.org/. Manager - The British Journal of Administrative Management. Retrieved Jun 30, 2022, from https://tbjam.org/vol58-issue-150/
[7]. Gaur, S. (2022). Understanding the Importance of Project Planning and Scheduling in Indian Construction Projects. Journal of Positive School Psychology, 6(3), 3535-3544.
[8]. Harsh Saxena, P. S. (2018). Causes and Effects of Delays in Indian Construction Projects. Journal of Advances and Scholarly Researches in Allied Education, 15(9), 231 - 242. Retrieved from http://www.ignited.in/I/a/58029
[9]. Hasan, S. (2016, November 17). https://blog.taskque.com/. Retrieved June 05, 2022, from Taskque: https://blog.taskque.com/causes-project-failure/
[10]. Hodgson, L. (n.d.). https://sitemate.com/. Retrieved June 03, 2022, from Sitemate: https://sitemate.com/resources/articles/construction/construction-documents-checklist/
[11]. IANZ. (2021, March 9). https://www.ianz.govt.nz/. Retrieved June 05, 2022, from IANZ: https://www.ianz.govt.nz/news/the-importance-of-document-control

[12]. JOEVILGAS2. (2018). https://qaqcconstruction.com/. Retrieved June 09, 2022, from https://qaqcconstruction.com/2018/05/23/flowchart-document-controls-construction-project/

[13]. KENTON, W. (2020, November 27). https://www.investopedia.com/. Retrieved Jun 30, 2022, from Investopedia: https://www.investopedia.com/terms/q/quantitativeanalysis.asp#:~:text=Quantitative%20analysis%20(QA)%20is%20a,terms%20of%20a%20numerical%20value.

[14]. Preston, V. (2009). https://www.sciencedirect.com/. Retrieved June 30, 2022, from https://www.sciencedirect.com/topics/earth-and-planetary-sciences/questionnaire-survey

[15]. Software, E. F. (2022, February 27). https://www.linkedin.com/. Retrieved June 06, 2022, from LinkedIn: https://www.linkedin.com/pulse/poor-documentation-impacts-construction-7-ways-ezelogs/?trk=organization-update-content_share-article

[16]. Toolkit, H. (n.d.). https://resources.workable.com/. Retrieved June 05, 2022, from Workable Better Hiring: https://resources.workable.com/document-controller-job-description

[17]. Young, V. Z. (2018, February 14). https://www.projectcubicle.com/. Retrieved June 03, 2022, from Projectcubicle: https://www.projectcubicle.com/contract-documents/