

# Intelligent Contract Management

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**Abstract-** Contracting is an integral part of construction projects. Managing the contracts therefore is equally important for the success of any business process due to rapid increase in multiple contracts. The conventional method of managing contract involves risks and chaos which include inadequate information in contracts, inadequate delegation of authority and responsibility, fraud, theft, corruption, other unethical activities, communication gap, delayed financial decisions thus dampening the progress of the project, all due to manual intervention in managing contracts. This calls for a need of systematic and an effective method of contract management. This paper speaks about Intelligent Contract Management (automated contract management) which is an efficient, transparent and flawless concept of managing contracts. This technique will streamline the business process by reducing the time taken to create, review, execute and approve contracts, thus easing activities like tracking, central storage of contract documents, and reduction in disputes, minimize risks associated with manual data entry.

Contract management is an issue of strategic importance to both organization and to projects and through automated contract management technique; organizations can increase control, increase effectiveness, reduce cost and also provide strategic and competitive advantage. Key objective of automated contract management system is to ensure easy access to contract information to form flexible support for the contract workflow.

**Index Terms-** Automated Contract Management, Documentation, Change Management

## I. INTRODUCTION

The construction industry in this competitive world is undergoing number of changes. As a part of these changes the construction process is enhanced with the help of modern electronic systems to enable strong partners/stakeholders relationship. Due to these electronic advances appropriate systems are necessary to ensure proper management control of contracts, thus enabling automated contract management. It would be useful in managing the administrative aspects of contracting, meet contract obligations and avoid the risk of missed deadlines and other penalties. Contract management is an important factor which directly affects the following factors of the project: 1) Scope. 2) Quality 3) Time 4) Cost & 5) Resource.

The traditional method of managing contracts is all done manually. Some of the limitations in manual methods are:

- The process is slow and does not favour a life cycle cost approach to projects
- Requires large staff to conduct the whole process
- Communication gap between the partners/stakeholders
- Poorly drafted contracts

- Delayed financial decisions and so on...

Time demands for an Automated Contract Management to overcome most of the limitations of manual method and to gain maximum benefits from Contract Management process. The Workflow would be automated; the alerts and other regular reporting would be generated by pre-determined parameters. Visual effects often add to our understanding. Let me with the help of the below flowchart illustrate the basic concept of Automated Contract Management.

## II. OBSERVATIONS

### 1. Contract creation

Automated systems help to reduce the amount of time it takes to create, negotiate, review, execute and approve contracts with an electronic approach that automates workflow, automatically notifies partners/stakeholders, retain document version, history, provides electronic/digital signatures and keep track of all activities. For example, predefined format of Letter of Acceptance can be used to create a Letter of acceptance against quotation.

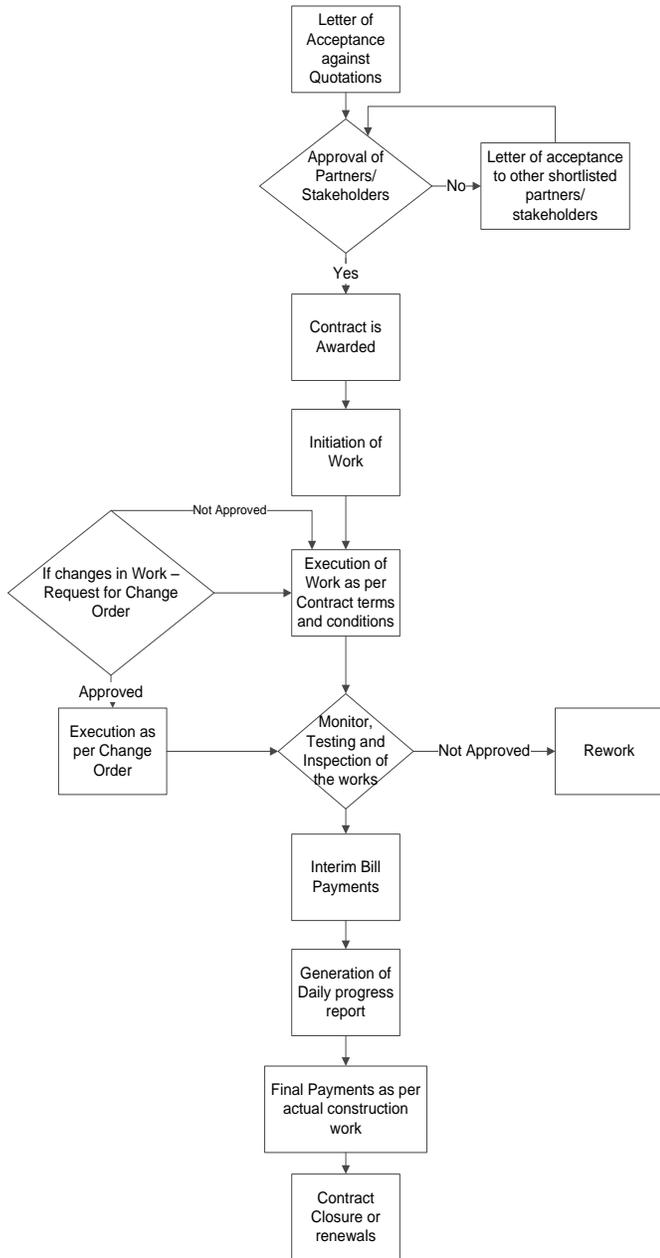
### 2. Contract Id/Code/No

A unique identification would be assigned to each Contract and general information recorded. This will allow reports to be sorted by partners and other stakeholders to gain a view of their overall performance across multiple contracts.

### 3. Document control

Document control in construction projects is the management of contract documents. It is the incoming and outgoing correspondence and their attachments, and their flow to the members of the management team for action or information. The easy availability of information encourages better decision making and improved management of contracts. It is essential that an accurate record of the project be maintained from the onset of the project until its completion. Parties involved are commonly: Architect, Consultants, Contractors, Sub contractors, Suppliers/Vendors etc. These parties involved in the organization can be notified when commitments and milestones are coming due, as well as when contracts are expiring and are due for renewal. Document control system covers all contract documents, such as minutes of meeting, daily progress report, drawing logs, submittals. It provides real time information stored in a central repository, so that parties can see where each submittal is in the approval process and know who is responsible for what and by when.

Details included in contract documents can vary in accordance with type of the contract, but items such as contract amount, contract date and contracting parties are included in all contract documents, which do not change. This can be summarized as below:



**Fig. 1. Automated Contract Management Process workflow**

Each stage indicates who would be involved, the processes to be followed, what data needs to be collected and where it would be re-directed. With a process map in hand the team would be in a position to assess opportunities for optimization through automation. In order to get the documents in an electronic repository with some amount of useful database fields, a unique key point/data will have to be captured as and when the documents are created. Points of integration with other systems are to be identified to work in line with functions and disciplines of other systems. For example, for bill payments the integration would be with the organizations accounting system (payables and receivables). Such simplified process workflows would also eliminate any occurrence of disputes and biasing.

Category	General Information
Essential Information	Contract Name, Type, Method, Date, Start Date, End Date and so on
Detailed Information	Depending on the type of contracts
Continuous action	Management of Contract history, Management of execution history
Others	Contract type grouping, Contract information document

**Table 1. Details and categories of Contract Document**

Document management also enables version control, access restriction and locked down as individuals tend to deviate from the protocols.

#### 4. Contract Change Management

A change is typically understood as the difference between the contract requirements as set forth in the original agreement between the parties and the requirements imposed subsequent to this agreement. Changes that arise during construction can originate with the owner, contractor, or even third party of the contract.

The change management process is divided into 4 parts: Identification> Evaluation> Approval> Notification. This process can be viewed in the below flowchart.

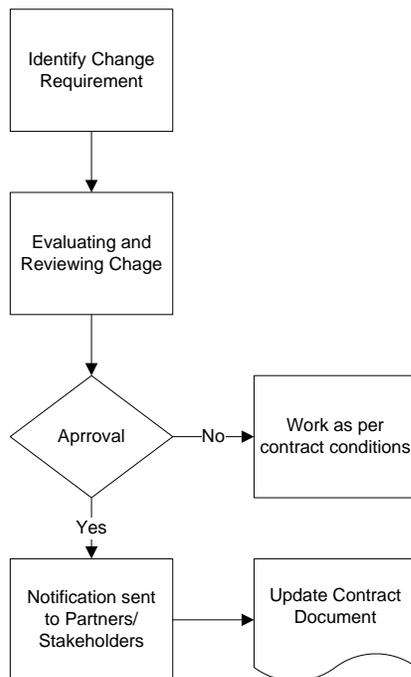


Fig. 2. Contract Change Management workflow

Above workflow stages can be elaborated as below:

**Identify Change Requirement:** In this stage of change management changes are pursued and requested. A change requestor designates a reviewer and approver. The requestor should attach relevant documents to help change reviewer/approver in next processes

**Evaluation and Reviewing Change:** This stage contains a significant amount of information as it is the most important stage in the change management process. Once review request on changes are received from the identification stage the change manager(s) conduct the assessment based on the evaluation criteria.

**Approval:** When an assessment is completed the evaluation scores are calculated automatically and then approval on changes is requested along with the evaluation results. However if the reviewers reject the changes the progress is returned to initial stage

**Notification:** An alert/ notification of approved changes with the final approval will be sent to each partner or stake

holders. Once the information is reviewed the contact document can then be updated.

All the information generated in the earlier process will be stored in the change database.

#### 5. Payments

Payments and collections depend largely on policies, procedures and systems to ensure:

- Good record keeping
- Financial billing and payment systems
- Streamlined and well documented procedures and
- Staff performance in carrying out routine tasks and timely escalations

Once the deliverables are complete the contractors will create an invoice receipt in the system this will in turn be verified by the accounts payable. Once verified, the payment then would be made to the contractors based on the payment terms maintained in the system.

#### 6. Reports

Daily work reports forms and visualized photos or videos can be uploaded for recording actual work completed, conditions at the project site, information on equipment and materials used, the results of field tests and other information. Information of these reports can be used to generate progressive payments. Visualized information will help the whole project team to know the status. The reports can be created in the corporate design in standard output formats and diagram type if desired. All reports would be automatically generated and sent on a regular basis via e-mail.

### III. BENEFITS

- Significant reduction in time and effort required to track and administer contracts.
- Improvement in business process efficiency throughout the contract management lifecycle with automated workflow.
- Reduction in manual processes and contract administration workload through process optimisation and automation.
- Consolidation of contract database
- Improved contract consistency and user- friendliness by leveraging contract template functionality
- Elimination of duplicate effort through integration with ERP, document management, and other legacy systems.
- Extensive reporting capabilities.
- Improved stakeholder participation
- Improved contract visibility & access to review and edit.
- Increased collaboration through online interaction which streamlines the creation, negotiation and management of contracts field and other non-contracting staff.
- Automated workflow allow users

#### IV. CONCLUSION

Contract management is an issue of strategic importance to both organisations and projects. Successful implementation of contract management may help the organisation upsurge its control over the contracts. It may increase effectiveness in managing the contracts and thereby reduce the costs and also provide strategic and competitive advantages. A smart contract management may facilitate the exchange of information in planning, designing, and other phases of construction. Intelligent contract management aids in maintaining quicker and better decisions, and has the potential to facilitate relationship contracting.

Remote access to the system via Internet enables speedy output. The contractors would not have to wait until the paperwork is processed. The automated workflow comes handy in timely decision making and thus eradicating the manual effort involved. It may also help in tracking the changes in the contracts and the owner of the contract changes. Progressive payments can be made based on the business conducted as per the terms of contract. The organization can keep an eye on the revenue leaks due to manual intervention and reduce the same on

implementation of intelligent contract management. A history of contacts can be maintained which may prove useful in evaluation of partners in future. There might be some unseen issues in contract management, which can be taken care of while we progress towards the successful execution of the intelligent contract management.

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