Critical Chain Project Management (CCPM)

Sharing of concepts and deployment strategy

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Objectives

- Why did we implement CCPM at Tata Chemicals?
- Provide an idea of CCPM, its concepts and benefits
- How CCPM was deployed in Tata Chemicals; The benefits we got out of CCPM
Why did we implement CCPM?
A Case for CCPM

- We wanted to speed up the implementation of our Capex projects and realize the project benefits sooner
- Senior management asked us to address this opportunity
- We explored few options and zeroed in on CCPM to pursue this opportunity
An Overview of CCPM
Typical Project Management

• Projects are typically managed based on critical path, the longest sequence of activities in a project to be completed on time for the project to complete on due date

• A couple of assumptions are made here:
  – Resources are available in unlimited quantities
  – Project tasks can be completed on the agreed upon (buffered) time

• However, the reality is otherwise mostly; Projects get delayed even after padding up the tasks (30% to 100%)

• CCPM provides a framework to tackle these uncertainties and yet complete projects on time (and therefore, within budget)
• CCPM’s main distinguishing features are:
  – Identification and insertion of common buffers
  – Managing resource dependencies, and staggering projects
  – Monitoring project progress and health by tracking the consumption rate of the buffers rather than individual task performance to schedule.
  – And also a couple of hygiene aspects:
    • Do not multitask
    • Ensure you have all resources and info need to perform a task before starting it (a.k.a. full kitting)
Why CCPM? – A recap

• Institutionalized and proven way to manage projects
• Manage triple constraints
  – On time
  – Completion of Scope
  – Within Budget
• Manage project resources well
• Deliver projects quickly so that the opportunity cost is not squandered
Business Benefits of CCPM

**LEAD TIME**
- 20-50% Faster

**ON-TIME DELIVERY**
- 95% + on time
- 5% Late

**COST REDUCTIONS**
- 10-30% Savings

**QUALITY**
- No compromises
- Often improved quality
- Quality

**CULTURE**
- More collaboration
- Better teamwork
- Improved morale

TATA CHEMICALS LIMITED
Planning Projects in CCPM

• Plan a project by conventional standard

A B C D E F

• Typically, the conventional plan will include 30-100% buffer in tasks and will actually look like this:

A B C D E F

• After planning, crush the project timeline by 50%, and add the time saved as a common buffer at the end

A B C D E F
Planning Projects in CCPM

- Projects have overall project buffer and feeding buffers
Scheduling Projects in CCPM

- If you have multiple projects that use a common “constrained” resource, stagger projects so that the constrained resource is not over deployed.
- CCPM is arguably the only PM methodology that views projects from such a portfolio standpoint.
Scheduling Projects in CCPM

- Reduce transfer batch size:
- For example, a construction project will have the sequence of piling, erecting column, mounting trestles, and laying roof.
- Conventionally, tasks are sequenced as following:

```
| Lay Foundation | Erect Column | Mount Trestles | Lay Roof |
```

- Alternatively, CCPM suggests the following sequence:

```
Lay Foundation
Erect Column
Mount Trestles
Lay Roof
```

- You don’t need to complete the entire foundation to erect columns
- After a few foundation piles, you can start to erect a column
Executing Projects in CCPM

- X-axis: Chain completion
- Y-axis: Buffer consumption
- Look for trend
- When in Green, do nothing
- When in Yellow, create buffer recovery plan
- When in Red, look for added resources (re-allocated from other “Green” projects)
Managing a Portfolio of Projects

- This is how you manage a portfolio of projects
- The health (buffer consumption) of each of the projects is captured
- Resources between projects can be re-deployed to course-correct the laggard projects
Full Kitting

• Often, tasks of a project wait for:

Tasks are Started ….. Stopped …
Re-started ….. Stopped
for want of Full Kit

• Therefore, ensure you have all resources and information prior to starting a task
Why not CPM using MS Project? 
Why CCPM using BM3?

• CPM encourages local safeties in task estimations; Local safeties ensure ‘delays are passed on; gains are not’
• CCPM facilitates aggregating the local safeties into Project (or feeding) buffers
• CCPM handles the problem of allocating scarce resources across multiple projects at the same time very well and direct those resources to the projects that require them the most
• The BM3 software reflects the principles of CCPM
• It is easy to learn BM3
Planning a Project
Get the project objectives clear

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Building Construction AM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td><strong>To provide a residential dwelling</strong></td>
</tr>
<tr>
<td>Deliverables</td>
<td>Residential building as per agreed plan, with all amenities such as electricity, water, and drainage</td>
</tr>
<tr>
<td>Success Criteria</td>
<td>The owner is given keys to his fully functional and completed unit on or before the committed date</td>
</tr>
<tr>
<td>Requests to Mgmt</td>
<td>Imported items (elevator, security systems, solar panels, etc.) are to be procured and received without getting held up</td>
</tr>
<tr>
<td>Risks</td>
<td>Late delivery of 0.5% of the total price for every week of delay. After 20 weeks of delay, the project will start making loss</td>
</tr>
</tbody>
</table>
Planning – Getting Started

• After capturing the project objectives, think about the last task that will happen prior to the project delivery
• Likewise, keep moving to the ‘last but one’ task, and so on until you reach the first task
• Allow project to branch out as needed
• Let us start doing it practically using post-it notes
Play planning video – 11 minutes

https://youtu.be/xs_ytOoeL1o

(From 27:01 to 38:00)
Next video episode:

Moving Plan from Paper to Software
How we implemented CCPM at Tata Chemicals
Pre-deployment

- Visited Tata Steel (a pioneer in CCPM); learnt their practices
- Visited another (non-Tata) MNC, a mature CCPM practitioner
- Identified a good consultant who can take us through the CCPM journey based on our needs and resources
- Developed a deployment plan
Deployment Plan

- **Fulfill prerequisites**
  - Week -3 to 0

- **Conduct initial workshop**
  - Week 1

- **Prepare project plans per CCPM**
  - Week 1

- **Load projects in BM3 software**
  - Week 3

- **Pursue and review projects**
  - Week 4 +
Prerequisites

• Sought and received the support of senior leaders
• Selected 5 key projects
• Nominated project leaders
• Scheduled a one-week training workshop for CCPM
• Installed BM3 software
Workshops & Projects Planning

- Conducted workshop

<table>
<thead>
<tr>
<th>Day 1 and 2</th>
<th>Why, What and How to of CCPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 3, 4 and 5</td>
<td>Creating project plan for projects per CCPM</td>
</tr>
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</table>

- Came up with a detailed plan in A0 size sheet
- Identified resources for projects
- Entered projects in BM3 software
Projects Pursuit and Review Mechanisms

- Project managers updated their project progress
- Reviewed projects every week with the team
- Reviewed projects every month with the leaders
- All projects leads met once every two months to share experiences & learn
## Implementation Challenges Tackled

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited resources to spend on consulting and software</td>
<td>Identified affordable consulting and software support, without compromising quality</td>
</tr>
<tr>
<td>Resistance for the initiative as it is a new concept that was counter-intuitive to what people normally did</td>
<td>Once internal champion got convinced on the benefits, the rest of the team got on board</td>
</tr>
<tr>
<td>Unlearning what they have done in the past as for software</td>
<td>People got comfortable with the new software once they played around with it</td>
</tr>
<tr>
<td>Wary of investing more time in planning stage</td>
<td>Realized that it is better to invest 2 to 3 days in planning a 6 to 12 month project, rather than figuring them during the execution</td>
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Results

- Over a period of 20 weeks, we deployed CCPM in our major engineering center (Mithapur)

<table>
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<tr>
<th></th>
<th>Pre CCPM (10 projects)</th>
<th>Post CCPM (10 projects)</th>
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<tbody>
<tr>
<td>Due Date performance (DDP%)</td>
<td>30%</td>
<td>90%</td>
</tr>
<tr>
<td>Average delay of delayed projects (days)</td>
<td>93</td>
<td>42</td>
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- After this success and learning, we implemented CCPM in our North American operations, not just as PM tool, but also as a vehicle to help us run our critical business imperatives

- We also implemented CCPM for our corporate projects & imperatives

CCPM has become not just a project management tool, but an approach to the way we manage business
Knowledge Management

• We created a four part video series which covers
  1. Basic of CCPM and planning
     https://youtu.be/xs_ytOoeL1o
  2. Planning Projects in CCPM Using BM3 Software:
     https://youtu.be/h00BODT8qN8
  3. Staggering Scheduling and Resourcing Projects in CCPM:
     https://youtu.be/m0BEvjkGiic
  4. Executing and Managing Projects in CCPM:
     https://youtu.be/NsgbtrP6FVM
Who can use CCPM

- Organization that pursues projects, whether in software, service or in manufacturing
- Those who pursue multiple projects at the same time and would like to deploy resources judiciously
- Organization that pursues business imperatives (any imperative is a series of tasks and hence a project)
Thank you