

Project Process Development for Tender Projects using Visual Project Management in Retail Fueling, Industrial Segment Organization

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ABSTRACT

The paper emphasizes on the project management process development for tender projects in retail fueling industrial segment organization. Visual Project Management is a concept that integrates visual thinking tools and data visualization methodologies with more traditional project communication and reporting practices. This approach enhances the techniques in presenting project data and improves understanding of critical project deliverables. With this methodology, a new process is proposed and implemented at the organization known as On Time Delivery Process. An OTD (On Time Delivery) matrix is created with the help of Microsoft Excel which will be standard format for this process. Project managers are going to fill critical project deliverables schedule data in the same excel format and the format will be maintained by the leader at the organization who will be responsible to present the data before management. This approach will help the organization to synchronize the project data with cross functional departments within the organization.

I. INTRODUCTION:

Project management is an extremely “data-rich” business activity. At any given time, project management practitioners are capturing, manipulating, transforming, and communicating hundreds of individual project data points. These data points include labour estimates, capital and operational expenses, task lists, performance metrics, calendars, cost-benefit analysis worksheets, risk profiles, trending data, and a seemingly countless number of other project-related artifacts.

As the speed of business continues to increase, and as focus on an ever-growing number of data points is needed to keep business and project execution in control, new and innovative tools and techniques are required to help busy executives make efficient and effective decisions on where to invest money and resources.

A project manager's world is already full of data visualizations, designed to transform complex and voluminous data into simple, effective communication tools. Visual Project Management offers up information delivered in such a way that anyone can consume it at a time, place, and manner that is convenient to them. It is known as pull based form of communication, Information is simply posted to a common location, akin to a bulletin board or document library. The recipient chooses what information they want to receive and when they want to access it. Most importantly, it creates an opportunity for the project manager and the project stakeholders to have a conversation about what information and specific data points are most important to them^[1].

II. LITERATURE REVIEW:

A. Project:

There are different definitions for project. Projects include activities that should be completed within a certain timeline and budget, meeting a certain level of quality^[2]. According to PMBOK, it defines the project in this way, ‘A project is a temporary effort undertaken to develop (create) a unique product or service’^[3]. A project deliverable is defined as any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project.

B. Project Management:

Project Management is an application of knowledge, skills, tools and techniques to meet the project requirements. The objective is to use the optimum resources to accomplish goal in minimum time. Project Management is a way of human work force, machinery and money in order to reach the final goal minus any errors within the first run. PMI literature suggests that a senior manager's support is a critical mission and that its effectiveness presence is influential in the success of the project.

C. Microsoft Project:

Microsoft Project is a project management software program developed and sold by Microsoft, which is designed to assist a project manager in developing a plan, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads. Project creates budgets based on assignment work and resource cost. As resources are assigned to the task and the program calculates the cost equal to the work times the rate, which rolls up to the task level and then to any summary tasks level and finally to the project level. The application creates critical path schedules, and critical chain and event chain methodology third-party plug-ins are also obtainable. Schedules can be resource leveled, and task networks are visualized in a Gantt chart. Additionally, Microsoft Project can identify divergent classes of the users.

D. SWOT Analysis:

SWOT analysis is an important tool for decision support and is generally used for systematic analysis of internal and external environments of organizations. It helps the organization to identify Strengths, Weakness, Opportunities and Threats. SWOT analysis works best when diverse groups or voices within the organization are free to provide realistic data points rather than prescribed data.

Every product, may be a physical thing or a service to business, is at first an idea. The journey of every product starts from Idea generation stage. Phase zero is Idea generation phase, where brainstorming product concepts based on customer needs, concept testing and market research. Market research also evaluates existing product which is providing the same solution as of new product (MS0).

The next phase starts with project initiation, where objective is to present business case to PPG (Product Planning Group) using project charter and financial templates to initiate project an allocate resources through next milestone (MS1).

The next phase is business case and specification lockdown phase (MS2A). In this phase, the product design requirements and financial planning is frozen. The second part of this phase (MS2B) is Design and work plan. Resources works on technical specifications, initial system design and finalize work breakdown structure and plan for the same.

The next phase is Design, Develop and Integrate, in this phase, people work on design feasibility, prototype development, material arrangement for prototype. DFMEA (Design failure mode estimation and analysis) sessions are done to analyze the different ways of product failure. Develop preliminary test plan for field trail and field trial strategy along with long lead item action list. The next part of this phase (MS3B) is Lab Verification. The objective of this phase is to execute test plan and test cases and validate product system to real world testing. (MS3C) This part includes field validation. The product is tested in real world and the project team drives deliverables through phase 3C to complete field testing and start working towards production planning and releases.

The next phase (MS4) is a release phase. All the technical specifications and drawings required for production planning are released with required efficient approvals from recognized organizations. The production team gathers the data and start the procedure for production.

The last phase (MS5) is production monitoring, Project manager monitors the process from order entry to final production.

III. PRODUCT DEVELOPMENT PROCESS IN ORGANIZATION:

IV. SWOT ANALYSIS ON PRODUCT DEVELOPMENT PROCESS IN ORGANIZATION:

<u>STRENGTH</u>	<u>WEAKNESS</u>
1. The process best suits for new product development. 2. A standard process used across the globe by Group Companies	1. In India Market region, an existing/developed Dispenser Unit product is asked by OMCs (Oil Marketing Companies) because of market is cost sensitive. OMCs ask for security advancement and advance features in the product. For such, to follow product development process is

	<p>time consuming and it is difficult to identify and represent critical project deliverables in project review meetings.</p> <p>2. Tender projects are cost and time sensitive projects. Company who wins the tender must deliver the product in least time as well as in least cost. Such situation demands for faster delivery of products. A lengthy procedure to follow will impact on project schedule.</p> <p>3. Product development process is a toll gated process, no further work until the toll gate permission is granted. For existing product, many activities in process does not applicable for tender projects. It makes the process uneasy to understand and implement.</p> <p>4. Nowadays, organization and Project Managers use new Visual Project Management tools for project monitoring and control such as MS Project. The process needs an update to sync with these tools.</p> <p>5. Tender projects consist of different model of dispenser units, product development process is best suited for one product development.</p>
<p><u>OPPORTUNITY</u></p> <p>1. The process needs improvement to monitor multiple product development in single project.</p> <p>2. Every project ends with lessons learned document. It helps the organization to update the process in upcoming project, The product development process needs flexibility to add previous projects with new concept.</p> <p>3. The process needs to be in synchronization with production team for production. For multiple product development project, process does not intimate the production team for released product's production on time.</p>	<p><u>THREATS</u></p>

V. ON TIME DELIVERY (OTD):

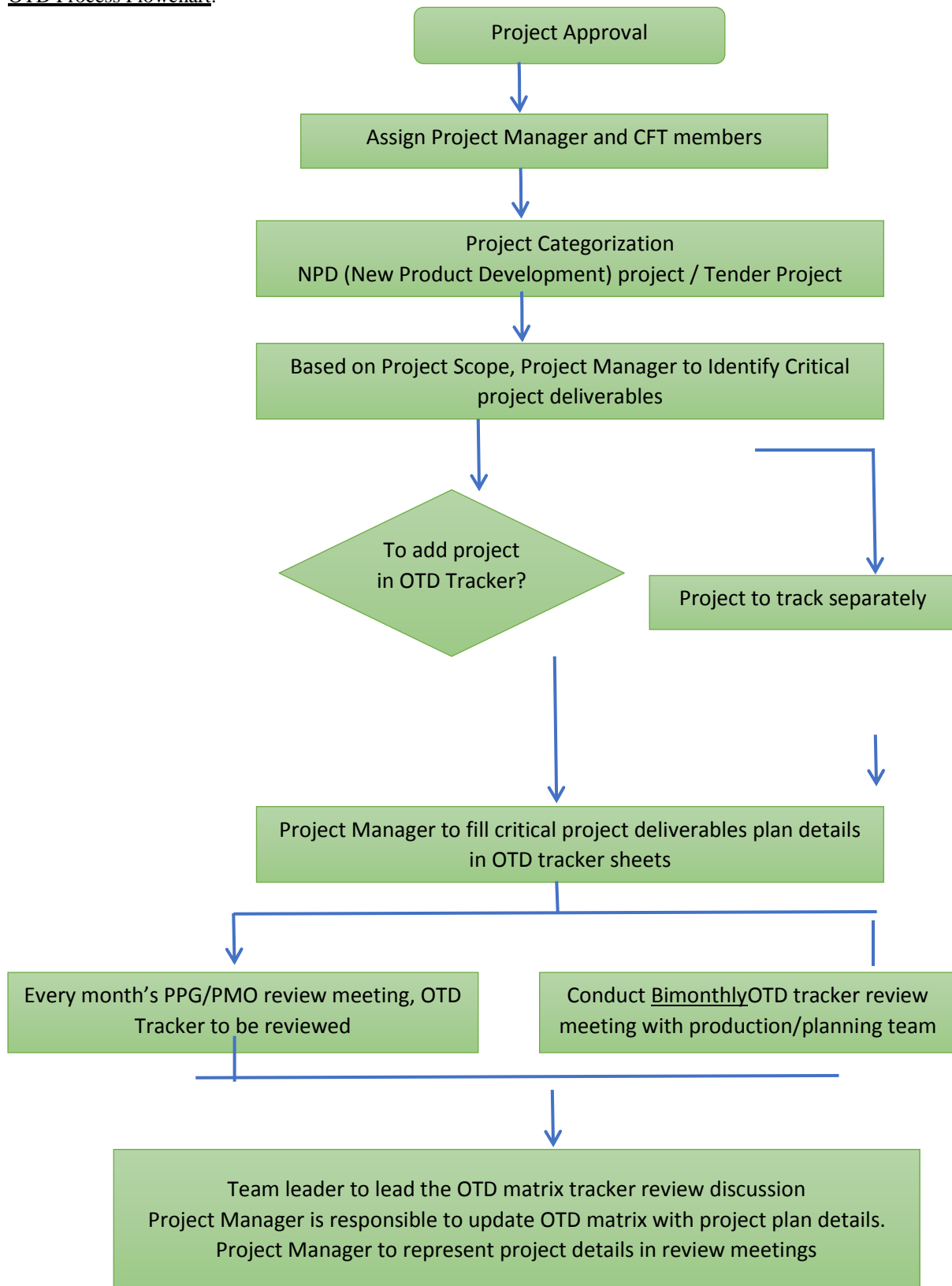
A new process to propose and introduce in organization as a requirement of process development. This process is an extension of Product Development process which will fulfil business requirement for department.

As we know, in the books of supply chain optimizations, On Time Delivery (OTD) is a measure of process and supply chain efficiency which measures the amount of finished goods delivered to customers on time. It also helps in determining how efficiently an organization is meeting customer's or agreed deadlines. OTD is a

concept majorly used by planning or production team to meet the deadlines of customers during the mass production.

First time, this concept is used in organization by PMO (Project Management Office) team as a data visualization technique. The concept will represent critical project deliverables with a comparison of planned vs actual. This concept will help organization to identify the process gaps and it will capture and highlight the delivery the project. The second part of concept will align the planning and production team to be in sync with PMO team to get ready for mass production.

OTD Process Flowchart:



Measurement Factors:

The two main factors that influence the OTD matrix window that is Engineering update and Operations/production update. Engineering

OTD matrix is updated by respective project manager for that project. Project manager is responsible for updating the details in OTD Engineering matrix update sheet.

		Date	Activity closed as per baseline date	Date	Activity closed but change from baseline date									
		Date	Activity closure as per baseline date	Date	Expected activity closure date but change from baseline date									
Sl. No.	Project/Program	Configuration	Project Start Date	Project Manager	Proto build completion	BOM (Bill of Materials) Completion	Mechanical release	Software testing completion	Field trial Completion	HW + SW release (Release for production)	Planned Duration (Critical Path)	Delay in duration	Schedule Variance	Contributors for Delay
1	HCL			A	Planned									
					Actual									
2	HPCL			B	Planned									
					Actual									
3	Shell			A	Planned									
					Actual									
4	Najara			C	Planned									
					Actual									
5	BPCL			B	Planned									
					Actual									

Fig1. On Time Delivery Engineering Update Matrix

Project manager reports the dates for the required milestone achievements in project. In fuel dispenser project, the critical milestone events are Bill of material preparation, Mechanical design release, software testing completion and Hardware and software release for production. Every start of project, the project manager plans for every milestone achievement.

- Activity closure as per baseline plan – Two different colour codes are assigned for this approach. The project manager is responsible to finish the activity as per baseline plan and if not happens, reports the reason of deviation to the management.
- Expected Activity closure change date from baseline date – Every project has risks and if risks are not mitigated with efficient mitigation or contingency plan on time, it has impact on project schedule. This is represented by different colour code. Project manager is responsible for highlighting the reason for deviation from baseline plan.
- Activity closed but change from baseline plan - Project manager must highlight the delayed activity closure to the management.

- Planned Duration (Critical path length): The shortest distance between project start ends and project end date including all sub-activities is called as critical path. Here, critical path length is the duration between project start date and Hardware and software release for production.
- Delay in duration: The delay is defined as the delay in project schedule as per baseline. The delay is duration between the planned date for Hardware and software release activity closure as per baseline plan and the actual hardware and software release activity closure date.
- Schedule Variance: It is the percentage indicator of schedule variance from baseline plan. It is calculated as delay in duration divided by the planned duration.
- Contributors for delay: This column indicates the reason behind the delay of activity closure as per baseline plan. Project manager is the key person to report the reasons and highlight these reasons before the management in PPG and PMO review meetings.

Engineering Update													Operation Update		
Sr. No.	Project/Program	Configuration	Project Start Date	Project Manager	Proto build completion	BOM (Bill of Materials) Completion	Mechanical release	Software testing completion	Field Trial Completion	HW + SW release (Final DFN release)	New Part Development	Operations Point of Contact	Production First time Built	Mass Production Start Date	
1	IOCL			A	Planned							P			
					Actual										
2	HPCL			B	Planned							P			
					Actual										
3	Shell			A	Planned							P			
					Actual										
4	Nayara			C	Planned							P			
					Actual										
5	BPCL			B	Planned							P			
					Actual										

Fig2. On Time Delivery Production Update Matrix

The second sheet influences the OTD matrix window is OTD Engineering and Operation matrix. The sheet is updated by project manager as well as planning team.

The major advantage of this sheet is to synchronize the engineering team and production/operation team with the project data.

- The Engineering update data is filled by project manager for respective projects and operations data is filled by operations team point of contact for respective project. Specifically, point of contact from operation team is the Deputy General Manager for planning team.
- Before the mass production start, the production team built a proto unit for the first time to know how the product is going to be. The manager plans for it and the same

information is shared with the engineering team. Earlier, this information is communicated verbally, now this information is documented.

- The manager also plans for the mass production date and the same data is being reported to the project manager.

VI. SHELL TENDER PROJECT:

Tender is an offer in writing by the tenderer (the person who offers the tender) to execute some specified work or to supply some specified good at certain rates within a fixed time frame under certain conditions of agreement. Project deliverable is to develop fuel dispenser units for Shell India Oil Marketing Company, meeting functional requirements and security features.

Models	Requirement
2*4*2 (Interim Solution)	Existing Model
2*4*2 (Basic Model)	Software Security Advancement
2*2*4 (Basic Model)	Software Security Advancement
2*4*4 (Premium Model)	Frontier Model, product design development
4*8*2 (Premium Model)	Frontier Model, product design development
1*2*2 (Premium Model)	Frontier Model, product design development, software security advancement.

Model name – 2*4*2 → Number of displays in dispenser unit
 → Number of Nozzles in dispenser unit
 → Number of products in dispenser unit

On Time Delivery Matrix for Shell Tender Project:



#	Program	Variant/Configurations	Project Start Date	Proto build completion	BOM (Bill of Materials) Completion	Mechanical release	Software testing	Field Trial Completion	HW + SW release (Final release)	Planned Duration (Critical Path)	Delay in duration	Schedule Variance	Contributors for Delay	
1	Shell	2*4*2 (Interim solution)	31-01-2022	Planned	NA	16-Feb-22	18-Mar-22	21-Apr-22	NA	25-Apr-22	67	-3	-4%	
				Actual	NA	14-Apr-22	13-Mar-22	25-Apr-22	NA	25-Apr-22				
2	Shell	2*4*2 (Final Solution)	04-04-2022	Planned	NA	13-Mar-22	15-Jun-22	14-Jul-22	NA	21-Jul-22	108	-8	-8%	
				Actual	NA	20-Apr-22	14-Jun-22	28-Jul-22	NA	13-Jul-22				
3	Shell	2*2*4 (Final Solution)	04-04-2022	Planned	NA	21-Mar-22	26-May-22	28-Jun-22	NA	29-Jun-22	102	-3	-3%	
				Actual	NA	21-Apr-22	27-May-22	08-Jul-22	NA	12-Jul-22				
4	Shell	2*4*4 (premium model)	31-01-2022	Planned	NA	22-Mar-22	27-May-22	29-Jun-22	NA	29-Jun-22	108	17	16%	>Software delivery for testing got delayed
				Actual	NA	21-Mar-22	28-Apr-22	29-May-22	NA	25-Jun-22				
5	Shell	4*8*2 (Premium Model)	31-01-2022	Planned	NA	23-Mar-22	28-Apr-22	29-May-22	NA	29-May-22	134	11	8%	>Software delivery for testing got delayed
				Actual	NA	11-Apr-22	22-Apr-22	28-May-22	NA	25-Jun-22				
6	Shell	1*2*2 (Premium model)	14-03-2022	Planned	27-Mar-22	27-Mar-22	27-Apr-22	28-Jul-22	NA	03-Aug-22	142	30	21%	>Product Testing is on hold for 30 days
				Actual	23-Mar-22	28-Apr-22	28-Apr-22	28-Aug-22	NA	03-Sep-22				
Total Project Duration										214	30	14%		

Fig 3.10 Shell Tender Project OTD Engineering Update Matrix



#	Program	Variant/Configurations	Project Start Date	Proto build completion	BOM (Bill of Materials) Completion	Mechanical release	Software testing	Field trial Completion	HW + SW release (Final release)	Planned Duration (Critical Path)	Delay in duration	Schedule Variance	Operation Update			
													Operations Point of Contact	Production First time Built	Mass Production Start Date	
1	Shell	2*4*2 (Interim solution)	31-01-2022	Planned	NA	16-Feb-22	19-Mar-22	21-Apr-22	NA	25-Apr-22	67	-3	-4%	Nityanadran	NA	30-Apr-22
				Actual	NA	14-Apr-22	13-Mar-22	25-Apr-22	NA	25-Apr-22					NA	12-Apr-22
2	Shell	2*4*2 (Final Solution)	04-04-2022	Planned	NA	13-Mar-22	15-Jun-22	14-Jul-22	NA	21-Jul-22	108	-8	-8%	Nityanadran	22-Jul-22	01-Aug-22
				Actual	NA	20-Apr-22	14-Jun-22	28-Jul-22	NA	13-Jul-22					22-Jul-22	01-Aug-22
3	Shell	2*2*4 (Final Solution)	04-04-2022	Planned	NA	21-Mar-22	26-May-22	28-Jun-22	NA	29-Jun-22	102	-3	-3%	Nityanadran	22-Jul-22	03-Aug-22
				Actual	NA	21-Apr-22	27-May-22	08-Jul-22	NA	12-Jul-22					23-Jul-22	04-Aug-22
4	Shell	2*4*4 (premium model)	31-01-2022	Planned	NA	22-Mar-22	27-May-22	29-Jun-22	NA	29-Jun-22	108	17	16%	Nityanadran	19-Jun-22	31-Aug-22
				Actual	NA	21-Mar-22	28-Apr-22	29-May-22	NA	25-Jun-22					15-Jun-22	31-Aug-22
5	Shell	4*8*2 (Premium Model)	31-01-2022	Planned	NA	23-Mar-22	28-Apr-22	29-May-22	NA	29-May-22	134	11	8%	Nityanadran	15-Jun-22	26-Aug-22
				Actual	NA	11-Apr-22	22-Apr-22	28-May-22	NA	28-Jun-22					17-Jun-22	26-Aug-22
6	Shell	1*2*2 (Premium model)	14-03-2022	Planned	27-Mar-22	27-Mar-22	27-Apr-22	28-Jul-22	NA	03-Aug-22	142	30	21%	Nityanadran	15-Sep-22	01-Oct-22
				Actual	23-Mar-22	28-Apr-22	28-Apr-22	28-Aug-22	NA	03-Sep-22					20-Sep-22	15-Oct-22
Total Project Duration										214	30	14%				

Fig 3.11 Shell Tender Project OTD Production Update Matrix

VII. CONCLUSION:

Project management is the process of leading team work to achieve project goal within

time, cost, scope constraints. In today's challenging times, project managers job is not only to manage project scope, deliverables, teams, and project plan

but also to manage large volume of project data. The expectation from stakeholders is to not only manage the project data but also to visualize the data so that it will be easy for them to digest the data. On Time Delivery (OTD) is a critical project deliverables data visualization technique, which will benefit the project stakeholders to make decisions quickly.

The key advantage of this new approach, OTD (On Time Delivery) matrix shows the status of project monitoring, critical project deliverables. This data is available in a single MS excel workbook. The OTD matrix sheet is available at organizational SharePoint (Online Library), project stakeholders can have easy access for project information at any time.

To conclude, The OTD matrix model can be an effective data visualization way to represent project data in review meetings and will help organization to strengthen the communication process between cross functional teams.

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