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Project Analytics to Improve Project and Portfolio Decision Making

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Abstract:

The complexity of managing projects within the Triple constraints has been increasing day by day. Quick browsing through the changes over past one decade tells us how fast the *"Complexity"* of managing projects has been changing. Various factors contributing and will continue for next one decade to name few, as, *shortening product development cycles, changing customer expectations*, exponentially increasing usage of internet as well as *more number of millennial in the project teams.*

We believe, one of the ways to manage this complexity and the need of changing world, is using ***digitization***. The digitization of Project Development phases will provide all synchronized database available to each stakeholders appropriately and same can be used for Managerial decision making. Building Analytics on this database, Risks affecting Project Performance Parameters – Time, Cost, and Quality can be effectively predicted and controlled. In addition, status will be available for each project to individual project teams whereas Portfolio Dashboard will provide bigger picture for managerial decisions on Strategies & Organizational Priorities. Because of its real-time nature, it can be available across the world at the same time providing a common platform to network and common language to interact.

We, at Mahindra Trucks & Bus Division, have taken leap & bound steps in coming up with a home grown solution using internal strengths as well as benchmarking with industry bests, which we believe will go long way in changing the face of Project Management not only in MTBD but also in Mahindra Corporate and Automotive Industry.

Intent:

Digitization of Project Management process and application of Analytics will provide strategic value creation on the part of organizations.

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1 Introduction:

1.1 Evolution of Project Management:

We are into 21st Century, it's an era of digitization to enable quicker delivery, continual reduction in efforts and costs by applying managerial discipline, Project Management which is still relatively young.

Project management has been practiced for thousands of years but it was in mid-1950, Organizations commenced applying formal project management tools and techniques to projects. First-generation project management approaches integrated project planning, control, and management with time management approaches. In the mid-1980s, ever increasing competition and quicker product delivery made most manufacturers implement PM approaches and solutions for new product development. In this second generation of project management, the Work Breakdown Structure (WBS) helped project managers and systems engineers break projects into smaller, discrete work elements. The use of WBSs allowed businesses to better organize and define the work and scope of the project.

In the late 1980s, a need arose for project management in areas other than manufacturing and engineering. Global competition was heating up just as such project management organizations as the Project Management Body of Knowledge (PMBOK) and the Association for Project Management (APM) were emerging to put structure to the PM discipline. Project management processes became distinct and separate from product development processes, and PM methodologies underpinned the business management methods of the day, including business process reengineering and total quality management.

By the early 1990s, the discipline of project management had become a core competency for many organizations. PM manuals, procedures, tools, templates, and applications were widely disseminated through corporate intranets.

In traditional project management practice, projects typically focused on efficiency and operational performance, which mainly means meeting time and budget goals. However, dynamic business environments and global competition require finding new ways to use projects as competitive weapons. Now a days every new project initiated has business goal and achieving better business results is the outcome. Todays, project managers are increasingly required to focus on business aspects. Their role is expanding from getting the job done to achieving business results and winning in the market place. There is a clear distinction between operationally managed projects and strategically managed projects. Operationally managed projects focus on getting the job done, while strategically managed projects focus on achieving business results. In 21st Century, Organisation processes digitization provided all synchronized database available to each stakeholders on real time basis. In isolation Project status will be available for each individual Project whereas Portfolio Dashboard will provide bigger picture for managerial decision making to strategize the projects and Organizational Priorities. This is when third-

generation, strategic project management has emerged to address the ongoing concern of value creation on the part of organizations and Project Analytics gained strategic importance in Project Management.

1.2 Project Analytics:

Analytics can be defined as the systematic quantitative analysis of data to obtain meaningful information for better decision making. It involves the collective use of various analytical methodologies such as statistical and operational research methodologies, Lean Six Sigma, and software programming. Though Analysis and Analytics terms sounds similar but they do have some differences.

Parameter	Analytics	Analysis
Definition	Analytics can be defined as a method to use the results of analysis to better predict customer or stakeholder behaviors	Analysis can be defined as the process of dissecting past gathered data into pieces so that the current (prevailing) situation can be understood.
Time Period	Analytics look forward to project the future or predict an outcome based on the past performance.	Analysis presents a historical view of the project performance.
Tools	Predictive Analytics Tools	BI Tools

Table-1 Difference between Analytics and Analysis

2 Prevailing Practice at Mahindra:

Successful launch of Scorpio in 2002, which followed Project Management practice, made management impetus to further strengthen Project Management and utilize to fuller extent. This led to developing homegrown Product Development process with a blend of best Project Management Practices available around those times and formally releasing it as "MPDS" (Mahindra Product Development System) in 2005.

Over the period, while this process enabled many successful new Product launches helping Mahindra to achieve business objectives and strong business position in the market. On the other hand though formal Process was ensuring documentation, review, approval cycle at each stage of the project but continual updation of Project Plans, Project deliverables was becoming more challenging. Project Teams seating at multi-location, Project data use to be available with individual team members sharing project documents through emails often leading to issues like revision control, retrieval which prompted the need for centralized data ware house for Project Documents.

Then also data duplication, integration and errors was limiting the gain out of Project Server. Project documents review, approvals, Project Status reporting and Management Information System (MIS) was

time consuming and becoming burden for faster project delivery. Around same time other business processes like Manufacturing, Finance, and Materials Management were getting digitized through SAP, Team Centre, and Cordys. Looking at the benefits, it was making more valuable proposition, to digitize Product development process and integrate other IT tools.

With the increased Product portfolio and number of projects, complexity increased, demand for quicker and faster delivery to market increased. Organizations were managing long duration and short duration project with same development approach, demand was lean process for fast delivery and process automation to avoid duplication and real time project reporting.

3   Application of Project Analytics:

Project analytics can help project managers handle complex projects and keep them on-schedule and on-budget. Using analytics, project managers have the ability to go beyond simply capturing data and completing tasks as they are completed. Now, they can find out a multitude of information, including exactly how projects are performing, and whether or not they are in line with the overall objectives. Analytics provides project managers the ability to make strategic decisions and improve project success rate

3.1 Application of Tunnel Vision and Funnel Vision approach:

Organisation Projects comprises of short duration and long duration projects. As such processes, methods used for managing projects differs in their approaches. This is where Tunnel Vision approach for short duration and Funnel Vision for long duration projects was applied.

Tunnel vision – In these type of project, most of the Scope, developments are very clear and involves fast track execution with limited documentation and reporting. This approach focuses on project execution processes and ensures quick delivery. To deliver short duration projects with process digitization provides online real time data. Applying Analytics provides dashboards to support quicker decision making.

Funnel Vision – In this approach, Project deliverables are dynamic in nature looking at long duration and as project progresses deliverables firms up. Funnel that is wide in its view toward the future and then narrows as it recedes back to the present. Project Manager sit in the present at the narrow end. Instead of having narrowed constricted tunnel view, Project Manager can see a wide array of alternatives in front. Project Manager not only gets strategic target, but also see a spectrum of actions, events, and possible consequences that are unfolding around. Funnel Vision dramatically increases ability to pick up both signals of Risks and Opportunity early enough to act on them well in advance of their occurrence. Funnel vision increases ability to see the big picture, analyzes the future, integrates change management, revalidates project Targets at each stage of the projects which in turn makes better execution and decision making.

3.2 Project Analytics for Project Selection and Prioritization:

Project portfolio management is a dynamic decision process wherein a business's list of active projects is constantly updated, revised. In this, Product Portfolio Map for existing and under development Products is available, whereas new Product ideas when mapped it provides valuable information such as Project Cost, Resources, Product Competitiveness, Volumes. In this process new projects are evaluated, selected and prioritized; existing projects may be accelerated, killed, or de-prioritized and resources are allocated and reallocated to active projects.

Project Prioritization Matrix

Project Code	Project	Project Family	Volume	Cost	Resources	Duration	ROI	Regulatory	New Application	Competition	Technology	Improvement
102	New Application development	A	2200	460	22	14	22.3				●	
201	Variant development on CV	B	3600	772	23	18	24.3			●		
207	New Emission Development	C	4400	1039	16	12	12.7	●				
304	Tipper Variant Development	D	3200	232	8	24	23.8			●		

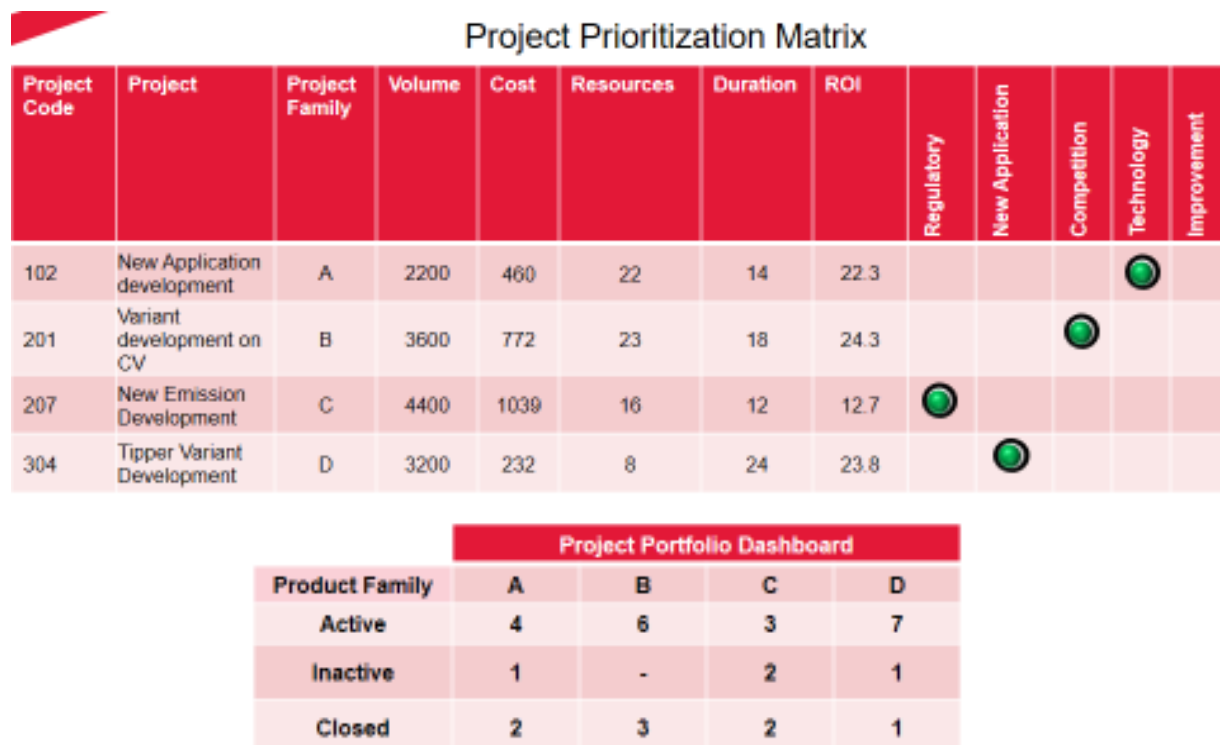|	Project Portfolio Dashboard			
Product Family	**A**	**B**	**C**	**D**
Active	4	6	3	7
Inactive	1	-	2	1
Closed	2	3	2	1

Fig – 1 Project Prioritization and Portfolio Overview

Selecting projects and optimizing the project portfolio that best align with the organization's strategic priorities is the essential focus of project portfolio selection. Organisation strategies like Advanced / Mass market Product Portfolio, Cost Optimization, Profit Maximization plays role in selection of Projects.

3.3 Focused dashboards for Project Visibility and Control:

Project Management with digitized process provides real time Project Progress for various areas. The Project Management Dashboard (PMD) is a customized Project MIS containing a variety of quality based project tracking and control metrics. The PMD enables the project manager to clearly monitor the "vital signals" of a project, to identify problems early and to trigger corrective actions in a timely manner. While every project is unique and requires its own specific set of controls, certain common informational needs exist across projects like-

a. Important and urgent Project Activities

b. Clear, sharper, Crisp Project MIS

c. Project measures, Targets on real-time

3.3.1 **Project Budget dashboards:** It allows to see the significance of budgeting and forecasting data at a glance, resulting better informed and timelier business decisions. It shows complex financial data in a display format that is easy to absorb and understand. An individual can quickly get an overall view of how a project spends its budgeted resources and what financial priorities exist.
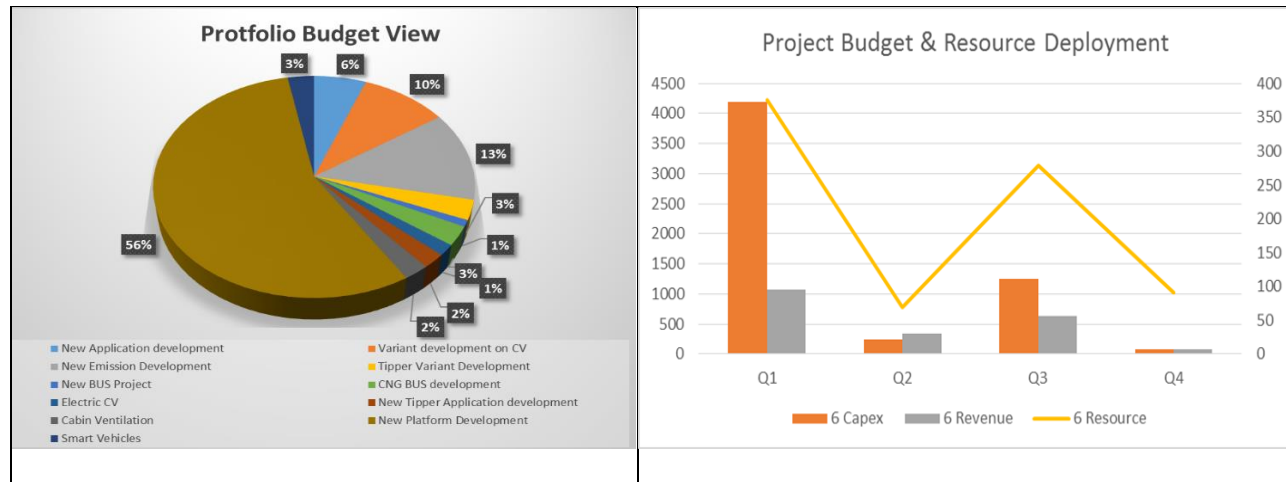
Fig – 2 Portfolio Budget and Resource Overview

With Finance dashboard providing trend Budget Plan Vs Actual, it helps course correction over the remaining financial year.

Project Name	W109	S105	U321	U302	U215	U220	P107	P409	W105	3G Chasis	U301	W202	P405	P60
Project Cost (Capex)	0.000669	0.000309	0.000591	0.000595	0.000384	0.000393	0.000189	0.000216	0.000486	1.5e-005	0.000426	0.000513	0.000198	0.0003
Budget Released	49	92	723	78	58	54	25	43	108	141	654	76	45	251
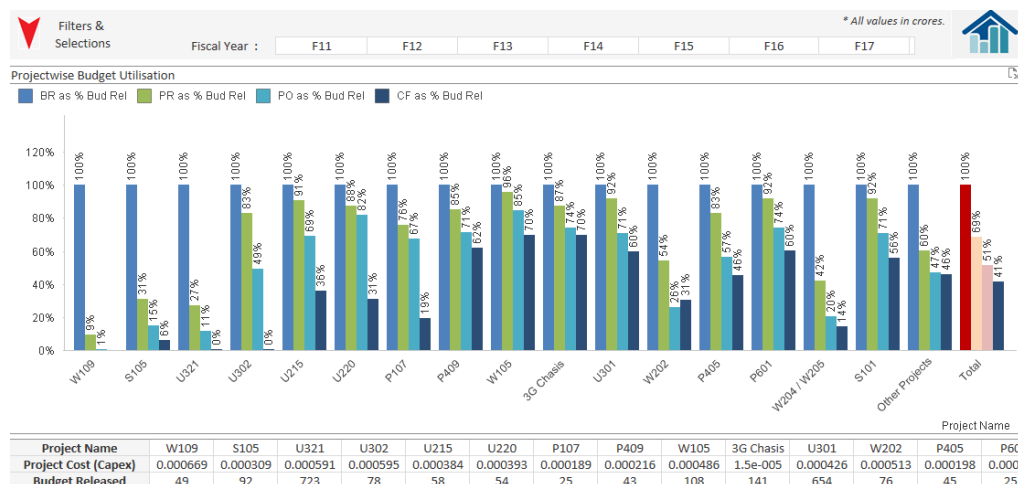
Fig-3 Budget Plan Vs Actual Dashboard

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3.3.2 Project Resource Dashboard: It shows you the most/least loaded team members, task types with the most hours allocated and diagrams with visualized time utilization. Also gives an overview of the total hours allocated and control over any discrepancies in allocation.
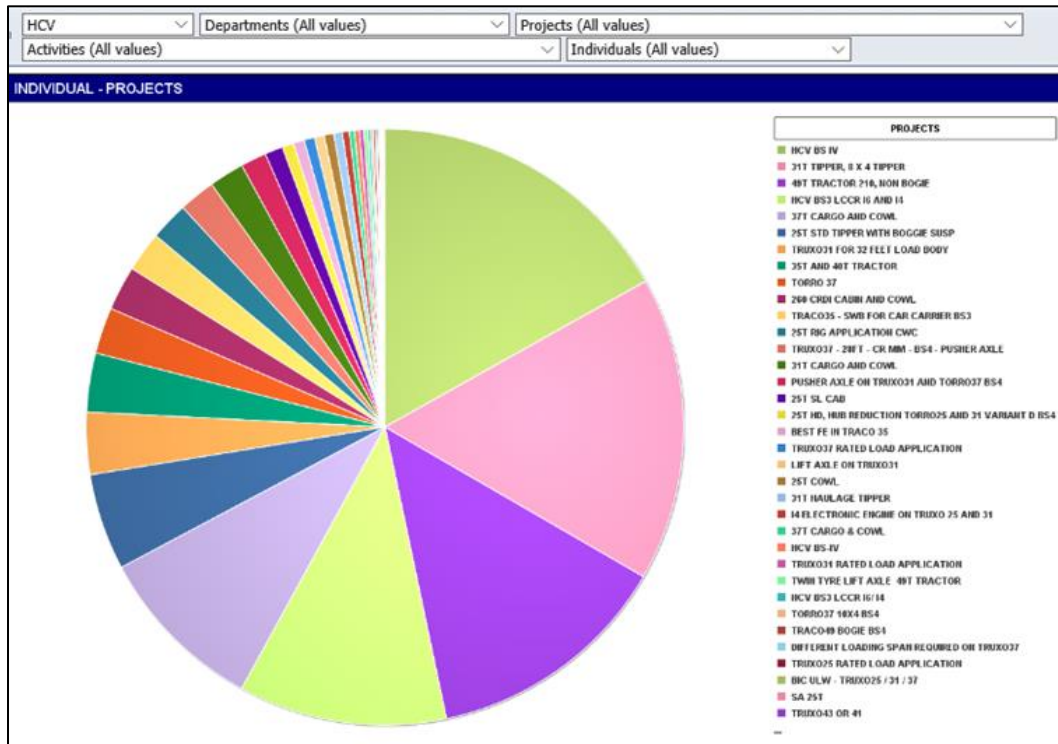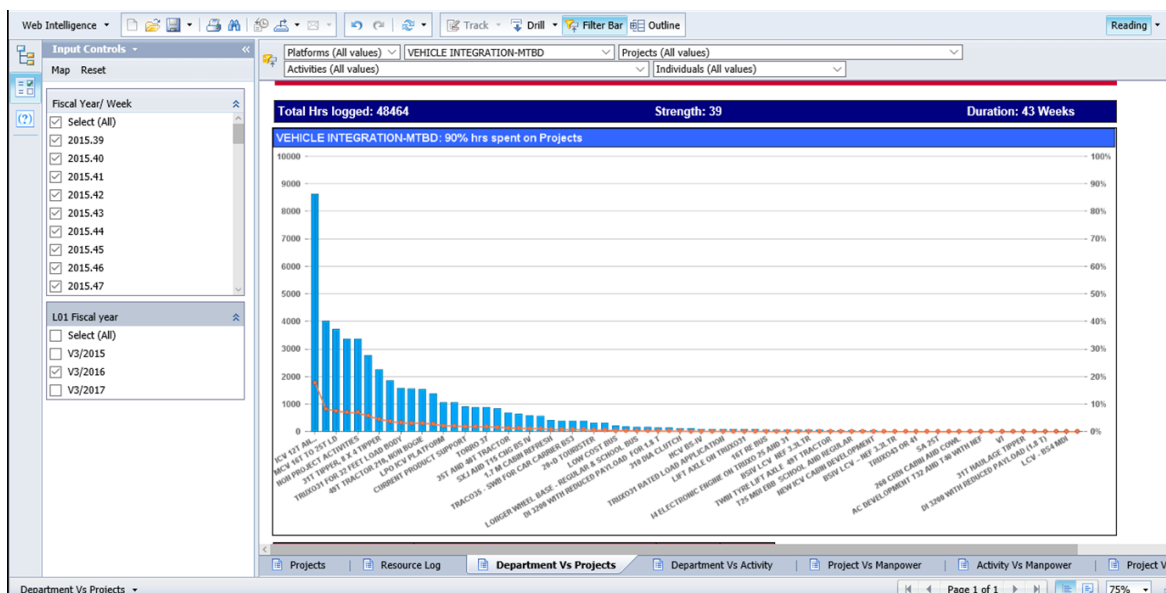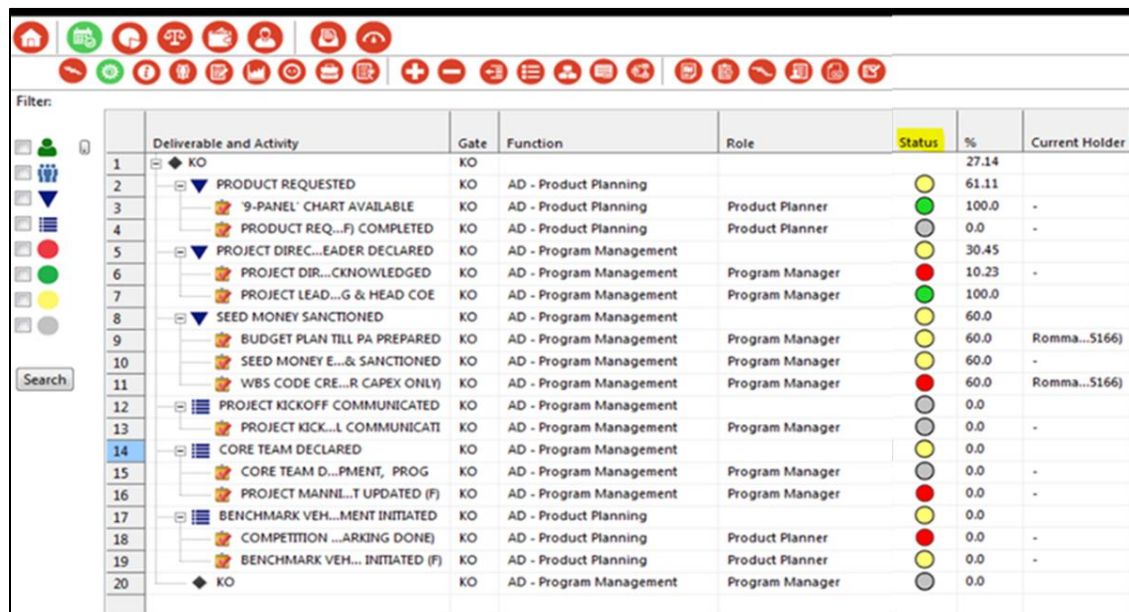

Fig-4 Resource Deployment Dashboard

Fig-5 Resource Time booking Dashboard

3.3.3 Project Deliverables dashboard: Use of routine project planning and control tools such as excel based Task Lists and Gantt Charts is not adequate to control a large-scale project. All projects need project plans, and project planning tools (like MS Project) are quite useful for generating schedules especially at the sub team level.

However, these kind of tools alone are usually inadequate for tracking and controlling complex and integrated projects. Task lists and Gantt charts are necessary, but the sole reliance on a tool such as MS Project makes for a very weak project information system that can fail to give the project manager adequate warning when deliverables are falling behind plan. However, without data consolidation and trend analysis the tool fails to provide unambiguous warnings when things are going wrong. The sole reliance on task lists and Gantt Charts can lead to the condition whereby the project manager finds that he/she is approaching a major milestone (i.e. review point) and behind schedule with little hope of recovery. A good way to avoid this kind of dilemma is to support project plans with early warning indicators consisting of critical path analysis and negative float calculations along with trend analysis and phase exit criteria. Such a project management information system provides the project manager with unambiguous warnings across all tracks of work on a project.

It operates very much like the warning lights on an automobile dashboard.

Fig-6 Project Deliverables Dashboard

3.4 Improved Project Stake holder management:

As Projects are becoming global, multi-location, multicultural with variety of stakes from individual stakeholders, managing them becomes significant and vital. Thus, the project team members, subcontractors, suppliers, and customers are invariably relevant. The impact of project decisions must be

considered in any rational approach to the management of a project. These stakeholders are outside the authority of the project manager and often represent serious stakes in project.

Project stakeholder management (PSM) assumes that success depends on taking into account the potential impact of project decisions on all stakeholders during the entire life of the project, management faces a major challenge. In addition management must consider how the achievements of the project's goals and objectives will affect or be affected by stakeholders outside their authority. So it re-instate, Stakeholder management is an important part of the strategic management of organizations.

Project stakeholder management is much like customer relationship management, real-time project data dashboards reporting to stakeholders provides Project Status and also ensures intervention.

7C's concept elaboration

a) Concern – Project Open concerns real-time status is available to Project Stakeholders.

b) Communicate – Project documents and Project Plans are online available to all stakeholders and provides real-time project progress report.

c) Contribute- Data sharing, online reviews, Approvals makes better contribution by stake holders.

d) Connect – Complete Project and Portfolio data being available digitally, faster connect and interaction within Project Teams.

e) Compound – Overall view and completeness of Project and Portfolio data creates synergy.

f) Co-Create – Project dashboards, Reports facilitate better engagement and decision making.

g) Complete – Provides complete information about Project life cycle.

3.5 Predict project schedule delays and cost overruns:

Analytics tells the project manager whether the project is on schedule and whether it's under or over budget. Also, analytics can enable a project manager to predict the impact of various completion dates on the bottom line. Following dashboard provides information about project deliverables completion and associated impact on timeline.
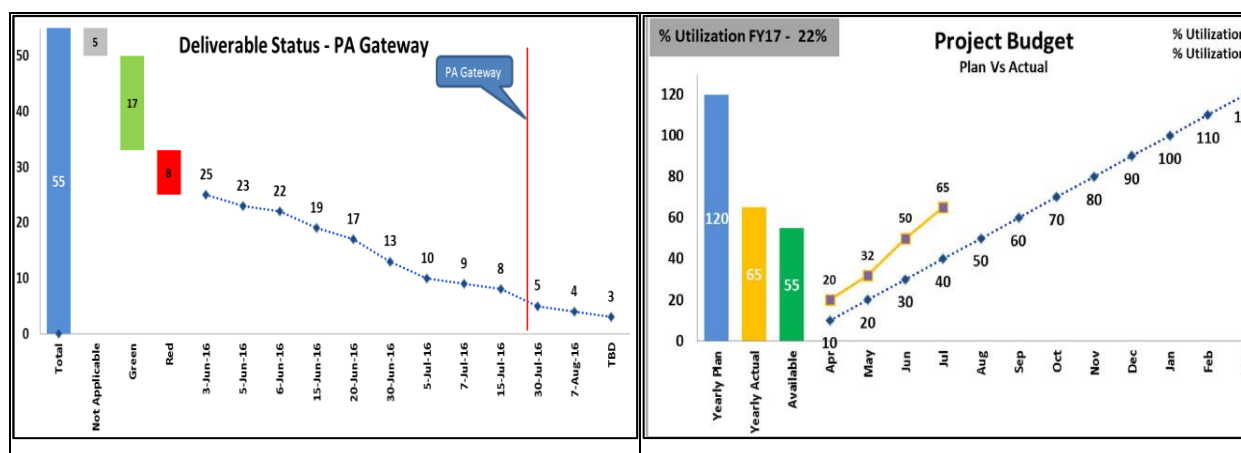

Fig-7 Project Deliverables completion Trend and Budget Overrun Dashboard

4 Conclusion:

Application of analytics to Digitized Project Management Processes will provide multitude level of benefits to Organisation categorically better project management and strategic management.

Benefits of Analytics for Project Management –

1. Integration of Project Schedule, Cost, Quality and Resource - 360 degree view.
2. Project Schedule delays, Cost Overruns, Project Open concerns and Risks can be better managed.
3. Project Analytical tool provides Project and Portfolio dashboards, providing better visibility for decision making.

Benefits of Analytics for Portfolio Management –

1. Complete portfolio overview in terms of Cost, Time, Resources and Risks.
2. Project Selection and prioritization based on portfolio analysis

5 Way ahead:

1. Leaner and lighter Project Management process.
2. Provide quicker access through developing & installing secured mobile apps, increasing visibility of critical milestones and decision points to stakeholders etc.

6 Recommendation:

Few suggestions to Project Managers and Organizations –

1. Before committing complete digitized solution for Project Management, formally document the process and evaluate the same for at least one Project lifecycle to refine and mature the Process as well as Organisation.
2. The new gen PM should clearly look within, learn and understand the needs of managing various business expectations, the changes coming in through lot of more & more millennial in the project teams, and how they can bring in the "value" through application of analytics

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Abbreviations

MPDS   Mahindra Product Development System

MIS   Management Information System

PMD   Project Management Dashboard

PSM   Project stakeholder management