

DESIGN AND DEVELOPMENT OF AN INTERACTIVE DASHBOARD FOR REAL-TIME DATA VISUALIZATION AND ANALYSIS

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Abstract

The increasing amount of data generated by businesses and organizations has led to a growing demand for effective data visualization and analysis tools. Interactive dashboards have emerged as a popular solution, allowing users to easily access, manipulate, and interpret data in real time. In this research paper, we present the design and development of an interactive dashboard for real-time data visualization and analysis. The primary objective of this research is to develop a dashboard that provides users with a comprehensive and intuitive interface for data exploration and analysis. The dashboard is designed to handle large amounts of data, presenting it in a visually appealing and easily understandable format. Additionally, the dashboard enables users to interact with the data in real time, allowing them to drill down into specific metrics and gain deeper insights. The research begins with an overview of the current state of data visualization and analysis tools. It then discusses the design principles and methodology used in the development of the interactive dashboard. The technical aspects of the dashboard, including the software and technologies used, are also described. Finally, the results of testing and evaluation of the dashboard are presented, demonstrating its effectiveness and usability. The interactive dashboard developed in this research provides a valuable model for other businesses and organizations looking to leverage their data for improved decision-making and strategic planning. By providing a comprehensive and intuitive interface for data exploration and analysis, the dashboard enables users to gain deeper insights into their data in real time.

Keywords: Dashboard design, Real-time data visualization, Data analysis, Interactive visualization, User interface, Data integration, Data processing, Data analytics, Google Sheets.

Introduction:

The Design and Development of an Interactive Dashboard for Real-time Data Visualization and Analysis research paper aims to explore the creation of an innovative and user-friendly dashboard that can display real-time data in a visually compelling way. The paper will delve into the process of developing the dashboard, including the technical aspects and design considerations.

The dashboard is designed to provide users with an easy-to-use platform that can collect, process, and visualize data from multiple sources in real time. The paper will discuss the methods used to ensure the accuracy and reliability of the data, as well as the tools and technologies employed to create the dashboard.

The dashboard aims to provide users with an interactive and customizable platform that can be tailored to their specific needs, and the paper will explore how this is achieved.

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Overall, the research paper aims to contribute to the field of data visualization and analysis by presenting a novel approach to real-time data monitoring and visualization, which is used as a visual representation in graphical and chart format, helps to identify the trends, It helps for generating reports and helps to measure efficiency.

Objectives:

The R & D department of "Forbes Marshall" was facing difficulty in knowing the projects status by all stakeholders of the projects which had an impact on decision-making for future work handling of the projects. As there was lots of mismanagement that occurred due to the non-availability of exact information of projects at the same time to every person associated with the projects. It was a time-consuming task to get every project status from the Gantt chart and difficult to present in cross-meetings and management meetings. Collective information as required by stakeholders to handle the projects and take necessary action for problem areas. The S, P, E1, E2, and D gateway used by them for all projects needed to be viewed by all stakeholders and management to get an idea about the project status. For this, an automated system was required.

The main objectives of this project are.

1. Designing a Framework for the creation, adoption, and success of a dashboard for a manufacturing company.

- 2. Implementation of the framework.
- 3. Creation of google sheets automation through which project status is identified.
- 4. Identifying processes in which the project is currently going on.
- 5. Creation of a visual chart and displaying analysis of projects.
- 6. Displaying the on-time score of projects.

Developing Effective Dashboard:

The effectiveness of the dashboard can be assessed by five potential benefits that they generate for the organization like sharing metrics for business problems, a framework for recognizingexcellent performance, diagnosing poor performance, and evaluating different options for remedial action. The dashboard should show the current position and perhaps forecast. It should be a tool for increased profitability and decision-making.

In this paper following points are taken into consideration for developing the dashboard

1. A dashboard is used to measure consistency across various departments in the organization.

2. A dashboard is used to monitor performance. Monitor in turn may be both evaluative and developmental.

- 3. Dashboard used to plan goals and strategies depending upon the current situation of the projects.
- 4. Dashboard used to analyze the complex and diversified data faced by senior-level management.

5. The current system used by the organization is the Gantt chart by this system it is become too difficult to get every project status, dashboard makesit easier to analyze.

Problems with the current system

1. It is a time-consuming task to get every project status from the Gantt chart and difficult to present in cross-meetings and management meetings.

2. It became difficult to coordinate with other departments, every time have to send emails for project status.

3. Mismanagement occurs due to not having exact information on projects.

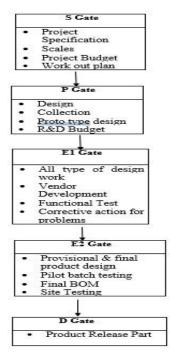
Framework for the Dashboard

This project aims to create an operational dashboard for the "*Forbes Marshall company*." The main challenge that the company faced was to have a single display for knowing different project statuses such as currently ongoing projects, analysis of the projects, and on-time scores of the projects. The R

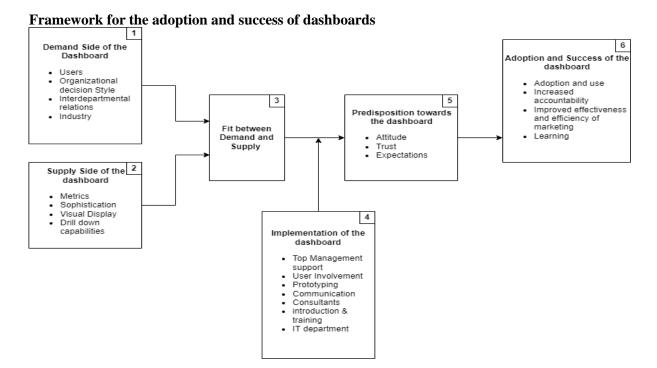
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& D department of "Forbes Marshall" was facing difficulty in knowing the projects status by all stakeholders of the projects which had an impact on decision-making for future work handling of the projects.

For any new project company was using S,P,E1,E2,D gateway process, the S,P,E1,E2,D process is as follows



(Fig. 1 SPEED gateway process)



(Fig. 2 Framework for the adoption and success of dashboards)



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As was already said, a dashboard that progresses past the first two stages has many of the same characteristics as a marketing decision support system. Therefore, we can build on the substantial literature on decision support systems and information systems to provide a framework for the adoption and success of dashboards.

The framework serves two purposes:

First, it serves as a jumping off point for research on the adoption and usage of dashboards. Second, it needs to assist businesses that want to create and use dashboards with a methodical inventory of pertinent issues.

The above figure depicts our approach, which proposes that dashboard adoption and success are determined by five major factors: demand, supply, the fit between demand and supply, the implementation process, and user predisposition.

Effective dashboards for the Forbes Marshall have developed the explanation of each dashboard is given below

	A	В	С	D	E	F	G	Н	I	J	К	L
1		RBES SHALL				FORBES I	MARSHALL					
2					R&D PRO	JECT MONI	TORING DAS	HBOARD				
3					Total Numbe	r for PROJEC	:TS (FY21-22)	43				
4	-											
5	PROJ	ECTS COMPLE	TED	27				Average	ON TIME GAT	E SCORE	41	
6]		[Targe	t ON time GATE	score	75]
7		ON TIME		17								
8		DELAY		10								
9								S	Р	E1	E2	D
10	PROJECTS	IN WORK IN PF	ROGRESS	4				0	0	1	0	3
11]							
12		ON TIME		1								
13		DELAY		2								

1. Projects Monitoring Dashboard

(Fig.3 Project Monitoring Dashboard)

Summary dashboard shows summary status of project, how many projects completed, work in progress, and how many projects are in S,P,E1,E1,D respectively. How many projects are going on in the current year out of which how many are completed on time, delayed and also how many are work in progress out of which how many are going delayed and how many are going on time. For work in progress projects the current gate of the project is also shown.For this dashboard one input sheet is there in which gatewise project data, planned and actual dates of gate opened and closed are filled and there is one more backend sheet which reflects data on the dashboard. Backend sheet is an important part of this dashboard. Parameters of project status are "Not started, Work in progress, On time, Delay, Before time" These status are depend on S Gate Open and P, E1, E2, D Gate close actual and planned Dates

Condition for Formulas

(Table 1 Conditions for making formula)										
Sr. No.	Actual Start Date	Actual End Date	Condition	Current Status						
1	Blank	Blank		Not Started						

- fy SI No

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2	Filled	Blank		Work In progress
3	Filled	Filled	Actual End Date = Planned End Date	On Time
4	Filled	Filled	Actual End Date > Planned End Date	Delayed
5	Filled	Filled	Actual End Date < Planned End Date	Before Time

Individual gate status & overall project status

First, we calculate individual gate status then overall project status displayed.

For calculation of gate status, we use the if formula.

IF(CELL NO="Hold","HOLD",IF(CELL NO="Pass","PASS",IF(CELL NO="NA","NA",IF(CELL NO="TBI","TBI",IF(AND(LEN(CELL NO)=0),"Not started",IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)=0,),"WORK IN PROGRESS",IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,CELL NO=CELL NO,),"ON TIME",IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)<>0,D2>C2),"DELAY",IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,CELL NO<CELL NO,"BEFORE TIME"))))))))

	G	н	1	J	K	1	M	N	0	P	0	R	5	T	U
I	P-Gate Actual	P-Gate STATUS	1-GATE Plann	eE1-GATE Actu	E1-GATE STATUS	2-GATE Plann	eE2-GATE Actu	E2-GATE STATUS	-GATE Planne	D-GATE Actual	D-GATE STATUS	PROJECT STATUS	PROJECT FINAL STATUS	ON TIME SCORE(IN %)	
	Jan2018	ON TIME	Apr2018		WORK IN PROGRES	Oct2018		WORK IN PROGRES	Sep2019		WORK IN PROGRESS	ON TIME	WORK IN PROGRESS	20	E1
	NA	NA	NA	NA	NA	NA	NA	NA	Sep2019		WORK IN PROORESS	NA	WORK IN PROGRESS	0	D
	Jan2019	ON TIME	Apr2019	Apr2019	ON TIME	Sep2019	Apr2020	DELAY	Sen2010	oun2021	DELAY	DELAY	COMPLETED	60	FALS
	Apr2019	ON TIME	Jun2020	Jun2020	ON TIME	Jun2020	Jun2020	ON TIME	Aug2020	Aug2020	ON TIME	ON TIME	COMPLETED	100	FAL
	Sep2019	ON TIME	Dec2019	Dec2019	ON TIME	Feb2020	May2020	DELAY	Feb2020		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	D
	Apr2018	ON TIME	Sep2018	Oct2018	DELAY	Feb2019	Sep2019	DELAY	repzony	~	WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	D
	Apr2019	ON TIME	Jun2019	Jun2019	ON TIME	Sep2019	Sep2021	DELAY	Sep2019	Sep2021	DELAY	DELAY	COMPLETED	60	FAL
	Pass	PASS	Pass	Pass	PASS	Feb2021	Feb2021	ON TIME	Mar2021	Mar2021	ON TIME	ON TIME:	COMPLETED	60	FAL
	Feb2019	ON TIME	Mar2019	Mar2019	ON TIME	May2019	Nov2019	DELAY	Mar2021	Mar2021	ON TIME	ON TIME	COMPLETED	80	FAL
	Mar2019	ON TIME	Jun2019	Jun2019	ON TIME	Sep2019	Jan2020	DELAY	Jan2020	Sep2021	DELAY	DELAY	COMPLETED	40	FAL
	Mar2019	ON TIME	Jun2019	Jun2019	ON TIME	Sep2019	May2020	DELAY	Sep2019	Aug2020	DELAY	DELAY	COMPLETED	60	FAL
	Dec2019	ON TIME	Mar2020	Feb2021	DELAY	Dec2021	Dec2021	ON TIME	Dec2021	Dec2021	ON TIME	ON TIME	COMPLETED	80	FAL
	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	20	FAL
	Aug2019	ON TIME	Oct2019	Oct2019	ON TIME	Oct2020	Oct2020	ON TIME	Nov2020	Nov2020	ON TIME	ON TIME	COMPLETED	100	FAL
	Pass	PASS	Pass	Pass	PASS	Pass	Pass	PASS	Dec2020	Dec2020	ON TIME	ON TIME	COMPLETED	40	FAL
	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	0	FAL
	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	20	FAL
	Jun2021	DELAY	Apr2021	Aug2021	DELAY	Sep2021	Dec2021	DELAY	Sep2021	Mar2022	DELAY	DELAY	COMPLETED	20	FAL
	Feb2021	ON TIME	Pass	Pass	PASS	May2021	May2021	ON TIME	May2021	May2021	ON TIME	ON TIME	COMPLETED	80	FAL
	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TEI	0	FAL
	Feb2021	ON TIME	Dec2021	Dec2021	ON TIME	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TEI	60	FAL
	Feb2021	ON TIME	Nov2021	Nov2021	ON TIME	May2022	Apr2022	BEFORE TIME	Mar2022	Mar2022	ON TIME	ON TIME	COMPLETED	80	FAL
	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	20	FAL
	Dec2020	ON TIME	Mar2021	Mar2021	ON TIME	Oct2021	Oct2021	ON TIME	Oct2021	Oct2021	ON TIME	ON TIME	COMPLETED	100	FAL
	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	0	FAL
	Pass	PASS	Sep2021	Sep2021	ON TIME	Jan2022	Jan2022	ON TIME	Jan2022	Jan2022	ON TIME	ON TIME	COMPLETED	60	FAL
	Pass	PASS	Jul2021	Jul2021	ON TIME	Sep2021	Sep2021	ON TIME	Dec2021	Dec2021	ON TIME	ON TIME	COMPLETED	60	FAL

(Fig. 4 Individual gate status & overall project status)

Projects completed/ work in progress

How many projects completed are shown and this data taken from the backend sheet, in the backend sheet from the final status of the project by using COUNTIF completed projects are counted.

Projects completed/ Work in progress on time, delay

Discussed above how to calculate completed projects now we are calculating completed on time, in backend sheet there is one column name as Project status where we can find status of project, from this column we get data for on time as well as delay project and by simply using COUNTIFS, here we use COUNTIFS because we are taking multiple conditions for calculating status.

For finding the current gate of the project, if the actual date of the next gate is not written then the status of the previous gate will display as status of project.

Average on time score



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For calculate average on time score we calculate first we calculate on time score of individual gate by simply taking out of five in how many gates on time score occurred (COUNTIF(Range,"ON TIME")/5)*100. A1 $*\int_{X} |S| \gg 0$

Å	1	0	0	t	,	٩.	×	1	3	ĸ	L	м	К.	0	2	0		1		1
SI, NO			C B-GATE Actual	S-GATE STATUS		P-Gate Actual	P-Gala STATU	and the second second	EI-GATE Actus		-	E2-GATE Actus		the second s	CO-GATE Actual	D-GATE STATUS	PROJECT STATUS	PROJECT FINAL STATUS	ON TIME SCORE IN %	
1	e VALV Actuators	Dec2017	Ma/2018	DELAY	Jan2018	Jan2018	ON TIME	Apr2018		ORK IN PROGRE	Dci2018		KORK IN PROGRES			WORK IN PROGRESS	ON TIME	WORK IN PROGRESS	20	Et
2	eVALV Balanced pr. Trima	NA.	NA	NA	NA	NA .	M	NA	NA	NA	NA	NA .	NA	Sep2018		WORK IN PROGRESS	NA	WORK IN PROGRESS	0	0
- 1	eVALV Class 150/000 - LNS Trim	Jar2019	Jan2019	ON TIME	Jan2019	Jan2019	ON TIME	Apr2019	Apr2019	ON TIME	Sep2019	Apr2020	DELAY	Sep2019	Jun2021	DELAY	DELAY	COMPLETED	60	FALS
4	eVALV Class 601 STD Trim	Oct2018	Oct2018	ON TIME	Apr2019	Apr2019	ON TIPE	Jun2620	Jun2020	ON TIME	Jun2020	Jun2020	ON TIME	Aup2020	Aug2020	ON TIME	ON TIME	COMPLETED	100	FALS
5	DN elizi-e	161	NA	NA	Sep2018	Sep2010	ON TIME	Dec2018	Dec2019	ON TIME	Feb2020	May2020	DELAY	Feb2020		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	0
ů.	SOPT-LHX	Feb2018	Feb2018	ON TIME	Apr2018	Apr2018	ON TIME	Sep2018	Oct2018	DELAY	Feb2019	Sep2019	DELAY	Feb2019		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	0
1	Vortex Oryness Traction Meter	Oc(2016	Oc2018	ON TIME	Apr2019	Apr2019	ON TIME	Jun2019	Jun2019	ON TIME	Sep2019	Sep2021	DELAY	5ep2019	5ep2021	DELAY	DELAY	COMPLETED	60	TALS
â	HeatMax Premium	Jun 2020	Jun2020		Pass	Pass	All	Pass	Pass	DLES	Feb2021	Feb2021	ONTRIC	Mar2021	Mar2021	ON THE	OTTOL	CONNECC	60	F/L1
9	UNTING (LaRu)	Aug2018	Aug2018	ON TIME	Feb2019	Feb2019	ON TIME	Mar2019	Mar2019	ON TIME	May2019	Nev2019	DELAY	Mar2021	Mar2021	ON THE	ON TIME	COMPLETED	9 80	FALS
10	#WTRES (wHART)	Aug2018	Aug2018	REFORCE INT	Mar2019	Mar2019	DI TIPE	Jun2019	Jun 2019	- Carr	Bep2019	Jan2020	DELAT	Jav2020	5ep2021	ULUM	CELAY	COMPLETED	40	FALS
11	FWTWS	Mar2019	Mar2019	ON TIME	Mar2019	Mar2019	ON TIME	Jun2019	Jun2019	ON TIME	Sep2019	May2020	DELAY.	Sep2019	Aug2020	DELAY	DELAY	COMPLETED	60	FALS
12	Red PEV	May2019	May2019	ON TIME	Dec2019	Dec2019	OK TIHE	Mar2020	Feb2021	DELAY	Dec2021	Dec2021	ON TIME	Dec2021	Dec2021	ON TIME	ON TIME	COMPLETED	80	FALS
13	mPRV	Apr2019	Apr2019	ON TIME	Hold	Hold	HLD	Hold	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	20	FALS
14	SOFTSOHC- OPC (Limited Release)	Aug2019	Aug2019	ON TIME	Aug2019	Aug2019	OV TIME	Oct2019	Oct2019	ON THE	Oct2020	Oct2020	ON TIME	Nov2020	Nov2020	ON TIME	ON TIME	COMPLETED	100	FALS
15	Steam Tracer System (OPC)	Aug2019	Aug2019	ON TIME		Pass	PASS	Pan	Pass	PA55	Para	Pass	PASS	Dec2020	Dec2020	ON TIME	ON TIME	COMPLETED	40	171.5
16	Sulphur recovery Unit (OPC)	TBI	TBI	TBI	Pass	TBI	TBI	TBI	78	TBI	781	TBI	TBI	TBI	TBI	TB(TBI	TBI	0	EXLS
17	PITCVIII	3/2021	Jul2021	ON TIME	TBI	TBI	THI	TBI	TBI	TBI	TŘI	TBI	TBI	TBI	TBI	781	TBI	TRI	21	FALS
18	CRS for Sugar inductry	Aug2020	Aug2020	ON TIME	Apr2021	Jun2021	CELAY	Apr2021	Aug2021	DELAY	Sep2021	Dec2021	DELAY	Sep2021	Mar2022	DELAY	DELAY	COMPLETED	20	FALS
19	Smart FW Tank System- Phase 1	Aug2020	Aug2020	ON TIME	Feb2021	Feb2021	ON TIPE	Pass	Pass	PASS	May2021	May2021	ON TIME	May2021	May2021	ON TIME	ON TIME	COMPLETED	80	FALS
- 29	Smart Fill Tank System-Phase 2	TBI	TBI	TBI	TBI	TBI	191	TBI	TBI	18	TBI	TBI	TBi	TBI	TBI	TBI	TBI	TBI	0	TALS
21	Reactor Trap	Aug2020	Aug2020	ON TIME	Feb2021	Feb2021	ON TIME	Dec2021	Dec2121	ON TIME	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	60	FALS
22	HORE	Aug2020	Auj2020	ON TIME	Feb2021	Feb2021	ON TIME	Nov2021	Nov2021	ON TIME	May2022	Apr2022	BEFORE TIME	Mar2022	Mar2022	ON TIME	ON TIME	COMPLETED	80	DL1
23	Compact Control Valve	Jard021	Jan2021	ON TIME	Hold	Huld	HOLD	Huld	Hold	HOLD	nuid	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	20	FALS
24	mPLNP-Phase 1	2/2020	Ju(2020	ON TIME	Dec2020	Dec2020	ON TIME	Mar2021	Mar2021	ON TIME	Oct2021	0:62021	ON TIME	Oct2021	0682021	ON TIME	ON TIME	COMPLETED	100	FALS
26	040	Huld	Hold	HOLD	Hald	Hold	HELD	Hold	Hold	HOLD	Hold	Hald	HOLD	Hold	Hold	HOLD	HOLD	HOLD	0	FALS
26	FMRTRSI	Pass	Pass	PASS	Pass	Pass	PASS	Sep(2021	Sep2021	ON TIME	Jar 2122	Jan2002	ON TIME	Jan2022	Jan 2022	ON TIME	ON TIME	COMPLETED	60	FALS
27	FINEMSON-U	Pass	P210	PASS	Pase	Pass	PASS	Jul2021	3/0121	ON TAKE	5ep2021	Sep2021	ON TIME	Dec2021	Dec2021	ON TIME	ON TIME	COMPLETED	60	FALS
28	SOPT-NS	May2021	May2021	ON TIME	Jul2021	Jui2021	ON TIME	TBI	18	TBI	761	TBI	TBI	TBI	TBI	TBI	TBI	TÌÌI	40	FALS
29	New DCEM 2000	3/2018	Jul2018	ON TIME	Ad2018	Apr2019	OELAY	Dec2018	Oct2019	DELAY	Mar/2019	Jul2020	DELAY	Mar2019	May2021	DELAY	SELAY.	COMPLETED	20	FALS
30	Eductive NG	S NA	NA.	NA	NA	NA	M	Aug2016	3/2018	DELAY	Dec2016	Jul2021	DELAY	Sep2017	002021	DELAY	DELAY.	COMPLETED	0	FALS
31	Low cost UV SOX NOX (GCENSE)	Dec2017	Apr2019	DELAY	Sep2019	Dec2019	DELAY	Nov2015	Dec2020	DELAY	Mar2523	May2021	DELAY	Mar2020	Sep2021	DELAY	DELAY	COMPLETED	0	FALS
32	QCL + NO + NH3	Jun 2019	Aug2019	DELAY	Dec2019	5ep2020	DELAY	Mar2020	Mar2020	ON TIME	Hold	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	21	FALS
33	Wet Gas Dust Analyser (DCEW 3100)	Sep3019	Sep2019	ON TIME	Jar 2020	Jan2020	ON TIME	Mar2020	Oct2020	DELAY	Dec2020	Mar2021	DELAY	Dec2020	Sep2021	DELAY	DELAY	COMPLETED	40	FALS
34	Smart POZ+ (Men Ex)	NA.	NA	NA	NA.	NA	NA.	5mp2020	Sep2120	ON TIME	Dec2021	Dec2021	ON TIME	Mar2022	Mar2022	ON TIME	ON TIME	COMPLETED	60	FALS.
35	Epos VC	NA.	NA,	NA	NA.	NA	NA.	NA.	NA	NA	NA	NA	NA	Apr2021	Apr2021	ON THE	ON TIME	COMPLETED	20	FALS
38	HLRT - Aqua 4 Trans	Pass	Pats	PASS	369021	Jui2021	ON TIPE	Oct2021	0et2121	ON TIME	Jan2022	Jan2022	ON TIME	Mar2022	Mar2022	ON THE	ON TIME	COMPLETED	80	FALS
37	HART - Aqua 2 Trans	NA	NA	NA	NA	NA	NA	Oct2021	Oct2021	ON TIME	Jan2022	Jan2022	ON TIME.	Mar2022	Mar2022	ON TIME	ON TIME	COMPLETED	60	FALS
38	Aqua 2 Trans (pH, Cond)- Non HART	NA.	NA	NA	144	NA	NA	Oct2020	Oct2020	ON TIME	Dec2020	Dec2020	ON TIME	Feb2021	Sep2021	DELAY	DELAY	COMPLETED	40	FALS
39	Turbidity Sensor + Transmitter	Huld	Hald	HOLD	1102	Hold	HOLD	Hald	Hold	HOLD	Huld	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	0	FALS
40	ANA Bullparameter CIC	Pass	Pass	PASS	3./2021	3,0001	ON TIME	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20	FALS
41	Extra Low Wetness Keter (Nozzie Orifice)	NA	NA	NA	NA	NA	NA	NA	NA.	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	FALS
42	Low Cout RTU	NA	NA	NA	NA	NA	SA	Jun2621	Jun2021	ON TIME	Oct2021	54p2021	BEFORE TIME	Sep2021	Sep2021	ON TIME	ON TIME	COMPLETED	.40	FALS
43	DCS Phase I	NA	NA	NA	NA	NA	M	Aug2021	Aug2021	ON TIME	Sep2021	Oct2021	DELAY	Oct2021	0cd2021	ON TIME	ONTINE	CONFLETED	40	FALS

(Fig. 5 On time score of projects)

Find out Final Project status

Used in Sheet 40(2) in input sheet for column S It can take value from D gate Actual (input sheet for column P) Please see below red colour border columns and arrow for reference

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1	1	X	L	М	N	0	P.	Q	R	S	T	. 0
GATE Plann	eE1-GATE Act	a E1-GATE STATUS	2-GATE Plann	ne E2-GATE Actu	E2-GATE STATUS	-GATE Planne	d D-GATE Actual	D-GATE STATUS	PROJECT STATUS	PROJECT FINAL STATUS	ON TIME SCORE(IN %)	
Apr2018		WORK IN PROGRES	Oct2018		WORK IN PROGRES	Sep2019		WORKINPROGRESS	UN TIME	WORK IN PROGRESS	20	E1
4	NA	NA	NA	NA	NA	Sep2019		WORK IN PROGRESS	NA .	WORK IN PROGRESS	0	D
Apr2019	Apr2019	ON TIME	Sep2019	Apr2020	DELAY	Sep2019	Jun2021	DELAT	DELAY	COMPLETED	60	FALSE
Jun2020	Jun2020	ON TIME	Jun2020	Jun2020	ON TIME	Aug2020	Aug2020	ON TIVE	ON TIME	COMPLETED	100	FALSE
Dec2019	Dec2019	ON TIME	Feb2020	May2020	DELAY	Feb2020		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	D
Sep2018	Oct2018	DELAY	Feb2019	Sep2019	DELAY	Feb2019		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	D
Jun2019	Jun2019	ON TIME	Sep2019	Sep2021	DELAY	Sep2019	Sep2021	DELAY	DELAY	COMPLETED	60	FALSE
Pass	Pass	PASS	Feb2021	Feb2021	ONTIME	Mar2021	Mar2021	ON TIME	ON TIME	COMPLETED	60	FALSE
Mar2019	Mar2019	ON TIME	May2019	Nov2019	DELAY	Mar2021	Mar2021	ON TIME	ON TIME	COMPLETED	80	FALSE
Jun2019	Jun2019	ON TIME	Sep2019	Jan2020	DELAY	Jan2020	Sep2021	DELAY	DELAY	COMPLETED	40	FALSE
Jun2019	Jun2019	ON TIME	Sep2019	May2020	DELAY	Sep2019	Aug2020	BELAN	DELAN	COMPLETED	60	FALSE
Mar2020	Feb2021	DELAY	Dec2021	Dec2021	ONTIME	Dec2021	Dec2021	ON TIME	ON TIME	MPLETED	80	FALSE
Hold	Hold	HOLD	Hold	Hald	HOLD	Hold	Hold	HOLD	HOLD	HOLD	20	FALSE
Oct2019	Oct2019	ON TIME	Oct2020	Oct2020	ON TIME.	Nov2020	Nov2020	ON THE	ON TIME	COMPLETED	100	FALSE
Pass	Pass	PASS	Pass	Pass	PASS	Dec2020	Dec202	ON TIVE	ON TIME	A ETED	40	FALSE
TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	0	FALSE
TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	20	FALSE
Apr2021	Aug2021	DELAY	Sep2021	Dec2021	DELAY	Sep2021	Mar2022	DELAY	DELAY	COMPLETED	20	FALSE
Pass	Pass	PASS	May2021	May2021	ON TIME	May2021	May2021	ON TIVE	ON TIME	COMPLETED	80	FALSE
TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	0	FALSE
Dec2021	Dec2021	ONTIME	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	60	FALSE
Nov2021	Nov2021	ON TIME	May2022	Apr2022	BEFORE TIME	Mar2022	Mar2022	ON TIME	ON TIME	COMPLETED	80	FALSE
0.00	0.00	1010	0.0	11.12	UNE		31.0		1000	1015		ELLOF .

(Fig. 6 Project Status)

=IF(CELL NO ="Hold","HOLD",IF(CELL NO ="Pass","PASS",IF(CELL NO ="NA","NA",IF(CELL NO ="TBI","TBI",IF(LEN(CELL NO)=0,"WORK IN PROGRESS",IF(LEN(CELL NO)<>0,"COMPLETED",IF(LEN(CELL NO =0),"NOT STARTED")))))))

Find Out Current Gate of PROJECT

= IF(AND(LEN(CELL NO)=0,LEN(CELL NO)=0,LEN(CELL NO)=0,LEN(M2)=0,LEN(CELL NO)=0), "S", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)=0,LEN(CELL NO)=0,LEN(CELL NO)=0,LEN(CELL NO)=0,LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)=0,LEN(CELL NO)=0, LEN(CELL NO)=0), "E1", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, "E1", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, "E1", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)=0, LEN(CELL NO)=0, LEN(CELL NO)=0, "E1", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)=0, LEN(CELL NO)=0, "E1", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)<>0,LEN(CELL NO)=0, LEN(CELL NO)=0, "E1", IF(AND(LEN(CELL NO)<>0,LEN(CELL NO)=0, "E1", IF(AND(LEN(CELL NO)=0, "E1", IF(AND(LEN(LEN(CELL NO)=0, "E1", IF(AND(LEN(LEN(LEN(LEN

	J	ĸ	0L	N	N.	0	P	D	R	5	т	U
1.	E1-GATE Actua	E1-GATE STATUS	2-GATE Plann	eE2-GATE Actua	E2-GATE STATUS	-GATE Planne	C D-GATE Actual	D-GATE STATUS	PROJECT STATUS	PRO ECTEMAL STATUS	ON TIME SCORE IN %)	CURRENT GATE
2	1	WORK IN PROGRE	Cct2018	1	WORK IN PROGRES	Sep2019		WORK IN PROGRESS	ON TIME	WORK IN PROGRESS	20	E1
3	NA	NA	NA	NA	NA	Sep2019		WORK IN PROGRESS	NA	WORK IN PROGRESS	0	D
4	Apr2019	ON TIME	Sep2019	Apr2020	DELAY	Sep2019	Jun2021	DELAY	DELAY	COMPLETED	60	FALSE
5.	Jun2020	ON TIME	Jun2020	Jun2020	ONTINE	Aug2020	Aug2020	ON THE	ON TIME	COMPLETED	100	FALSE
6	Dec2019	ON TIME	Feb2020	May2020	DELAY	Feb2020		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	D
τ.	Oct2018	DELAY	Feb2019	Sep2019	DELAY	Feb2019		WORK IN PROGRESS	DELAY	WORK IN PROGRESS	40	D
8	Jun2019	ON TIME	Sep2019	Sep2021	DELAY	Sep2019	Sep2021	DELAY	DELAY	COMPLETED	60	FALSE
ç.	Pass	PASS	Feb2021	Feb2021	ON TIME	Mar2021	Mar2021	ON TIME	ON TIME	COMPLETED	60	FALSE
10	Mar2019	ONTIME	May2019	Nov2019	DELAY	Mar2021	Mar2021	ON TIME	ON TIME	COMPLETED	80	FALSE
Π	Jun2019	ON TIME	Sep2019	Jan2020	DELAY	Jan2020	Sep2021	DELAY	DELAY	OCMPLETED.	40	FALSE
12 -	Jun2019	ON TIME	Sep2019	May2020	DELAY	Sep2019	Aug2020	DELAY	DELAY	COMPLETED	60	FALSE
13	Feb2021	DELAY	Dec2021	Dec2021	ON TIME	Dec2021	Dec2021	ON TIME	ON TIME	COMPLETED	80	FALSE
14 -	Hold	HOLD	Hold	Hold	HOLD	Hold	Hold	HOLD	HOLD	HOLD	20	FALSE
15	Oct2019	ON TIME	Oct2020	Oct2020	ON TIME	Nov2020	Nov2020	ON TIME	ON TIME	COMPLETED	100	FALSE
16	Pass	PASS	Pass	Pass	PASS	Dec2020	Dec2020	ON TIME	ON TIME	COMPLETED	40	FALSE
17	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBL	D	FALSE
18	TBI	TBI	TBI	TB	TBI	TBI	TBI	TBI	TBI	TBI	20	FALSE
19	Aug2021	DELAY	Sep2021	Dec2021	DELAY	Sep2021	Mar2022	DELAY	DELAY	COMPLETED	20	FALSE
20	Pass	PASS	May2021	May2021	ONTINE	May2021	May2021	ON TIME	ON TIME	COMPLETED	80	FALSE
21	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TBI	TEN	0	FALSE
22	Dec2021	ON TIME	TBI	TS	TBI	TBI	TBI	TSI	TBI	TBI	60	FALSE
22	Nov2021	ON TIME	May2022	Apr2022	BEFORE TIME	Mar2022	Mar2022	ON TIME	ON TIME	COMPLETED	80	FALSE

Please see below red color border columns and arrow for reference



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(Fig. 7 Current gate of project)

A	В	С	D	E	F	G	Н	I	J	K
	5			FORBE	S MARSHALI	L				
PROJECT GATEWISE MONITORING DASHBOARD										
S-GATE Planned S-GATE Actual P-Gate Planned P-Gate Actual E1-GATE Planned E1-GATE Actual E2-GATE Planned E2-GATE A									D-GATE Planned	D-GATE Actua
roject 1 👻	Dec2017	Mar2018	Jan2018	Jan2018	Apr2018		Oct2018		Sep2019	Aug2022
ATE STATUS	DEL	.AY	ON	TIME	WORK IN F	PROGRESS	WORK IN F	ROGRESS	DE	LAY
ELAY (Days)	90	0		0		0)	1	067
PROJECT STATUS COMPLETED										
N TIME SCORE IN %	20									
Project 1 Apr2018 Jan2018 Jan2018 Apr2018 Oct201	8 Sep2019		Aug2022	P-Gate Pia P-Gate Ac E1-GATE I E2-GATE I D-GATE P D-GATE A	tual Planned Planned Ianned					

2. Individual Project Analysis Dashboard

(Fig. 8 Individual Project Analysis Dashboard)

This dashboard is needed for finding individual project status according to gate in detail. Project Dashboard shows individual project's process wise (gate wise) status whether project is delay, on time and work in progress and overall status of project completed or work in progress and on time score, depending upon the project dates the graph of gates pop up and changes according to projects, and if project is delay then how many days delay is also shown in this dashboard. If you change the project from dropdown list the whole data of dashboard changes including graph. The data come here from backend sheet.

The project dropdown list occurred by using data validation, range tool and then for getting dates according to project name we use VLOOKUP function. For GATE status formula use is explained in the R & D dashboard already.

For getting delay in days, we simply subtract two cells but the format of these two cells must be date format then and then only we will get accurate delay in days.

3. IN DETAIL PROJECT TRACKING DASHBOARD

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	A	В	С	D	E	F	G	Н	I.
1		PRODUCT NAME : FMSMS - FORBES MAR	RSHALL S	SOPT MONI	TORING SY	STEM			
2		S : STUDY OF FEASIBILITY (Specs	sheet, st	udy and de	sign start)			% completio	83
3	Planned Start Date			Target Date	Planned End	Date			
4	25/03/2021 30/01/2021								
5	Actual Start Date				Actual End D	ate			
6	01/12/2020 07/07/2022								
7	Status								
9	0	Goals of the Study / Marketing Goals			Yes 🔻	· · · · ·			
10	1	Market Analysis /Need finding				· ·	Site visits pending		
11	2	MRS: Specifications (short version)			Yes 🔻	· •			
12	3	Budget for S - Phase			Yes 🔻				
13	4	Project Plan for S - Phase			Yes 🔻				
14	5	Form Cross functional Project core Team with Project sponsor			Yes 🔻	· · · · · · · · · · · · · · · · · · ·			
15									
16		DELAY	YEARS	MONTH	DAYS				
17		DEDA	1	5	-	7			
18									
19									
20									
21									
22									

(Fig.9 In detail project tracking dashboard)

This type of sheet and dashboard made for one particular project which gives gatewise task completion and progress of that gate according to task are shown by this shit. According to yes/no of task, progress of that gate is calculated and then if project is delay then how many delays is there is calculated.

A	В	С	D	E
SI. No	Project	STATUS	FINAL PROJECT STATUS	ON TIME SCORE
1	Project 1	ON TIME	WORK IN PROGRESS	20
2	Project 2	NA	WORK IN PROGRESS	0
3	Project 3	DELAY	COMPLETED	60
4	Project 4	ON TIME	COMPLETED	100
5	Project 5	DELAY	WORK IN PROGRESS	40
6	Project 6	DELAY	WORK IN PROGRESS	40
7	Project 7	DELAY	COMPLETED	60
8	Project 8	ON TIME	COMPLETED	60
9	Project 9	ON TIME	COMPLETED	80
10	Project 10	DELAY	COMPLETED	40
11	Project 11	DELAY	COMPLETED	60
12	Project 12	ON TIME	COMPLETED	80
13	Project 13	HOLD	HOLD	20
14	Project 14	ON TIME	COMPLETED	100
15	Project 15	ON TIME	COMPLETED	40
16	Project 16	тві	TBI	0
17	Project 17	тві	тві	20
18	Project 18	DELAY	COMPLETED	20
19	Project 19	ON TIME	COMPLETED	80
20	Project 20	тві	TBI	0
21	Project 21	тві	TBI	60
22	Project 22	ON TIME	COMPLETED	80
23	Project 23	HOLD	HOLD	20
24	Project 24	ON TIME	COMPLETED	100
25	Project 25	HOLD	HOLD	0
26	Project 26	ON TIME	COMPLETED	60
27	Project 27	ON TIME	COMPLETED	60
28	Project 28	тві	тві	40
29	Project 29	DELAY	COMPLETED	20
30	Project 30	DELAY	COMPLETED	0
31	Project 31	DELAY	COMPLETED	0
32	Project 32	HOLD	HOLD	20
33	Project 33	DELAY	COMPLETED	40
34	Project 34	ON TIME	COMPLETED	60

4. SUMMARY PROJECTS TRACKING DASHBOARD

(Fig. 10 Summary project tracking dashboard)

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This Dashboard shows all projects' statuses in one sheet. This is different from summary and dashboard Here we collect together projects status data and it reflects this can be used to find out, from all going projects how many are on time, delayed or, not started. According to status the colour of the cell changes for this conditional formatting used, for delay red colour appears, for on-time yellow colour appears like this.

Conclusion:

The research helped us to find an optimized automated solution in the form of a dashboard. It led to the creation of a dashboard that provided project status and give an analytical report which helped in the decision-making of the project work. The company guide recommended understanding the manual process thoroughly to identify actual days and planned days for projects and also to study the earlier reports. Secondary data, observation, and interviews helped a lot in the creation of the dashboard. During the following, we planned to take the project to next level by moving it to the Power BI platform along with more analytical decision reports such as the number of employees involved in the project and removal of process delay time.

References:

[1] <u>https://www.forbesmarshall.com/India</u>

[2] https://en.wikipedia.org/wiki/Project management

[3]https://en.wikipedia.org/wiki/Dashboard_(business)

[4] https://blog.sheetgo.com/spreadsheets-tips/how-to-create-a-dashboard-in-google-sheets/

[5] Christoph Grogera, Mark Hillmanna, Friedemann Hahna, Bernhard Mitschanga, Engelbert Westkamper the Operational Process Dashboard for Manufacturing 2013

[6] Katrien Verbert, Sten Govaerts, Erik Duval 1, Jose Luis Santos, Frans Van Assche, Gonzalo Parra, Joris Klerkx Learning Dashboards: An Overview and Future Research Opportunities

[7]Ogan M. Yigitbasioglu, Oana Velcu A review of dashboards in performance management: Implications for design and research 2014

[8] Koen Pauwels, Tim, H. Clark, David Reibstein, Bernd Skiera, Goethe Dashboards as a Service Why, what, How, and What Research Is Needed ??2009

[9] Henri Tokola, Christoph Groger, Eeva Jarvenppa,Esko Niemi Designing Manufacturing Dashboard On The Basis Of Key Performance Indicator Published in 49th CIRP Conference On Manufacturing System

[10] Iwona Zdonek Project Indicators Visualization Using an Interactive Dashboard

[11] Andrena Janes, Albetro Sillitti, and Giancarlo Succi Effective Dashboard Design

[12] Ogan M. Yigibasiloglu, OanaValcu A Review of Dashboards In Performance Management: Implication For Design and Reswarch

[13] M. Paige Borden, Orlando, FL Maureen Murray, Orlando, FL Ali Yorkos, University of Central Florida, Orlando, FL Developing a Dashboard to Aid in Effective Project Management

[14] Katrien Verbert, Sten Govaerts, Erik Duval , Jose Luis Santos, Frans Van Assche1 , Gonzalo Parra1, Joris Klerkx1 Department of Computer Science – KU Leuven Learning Dashboards: an Overview and Future Research Opportunities