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DIGITAL FACTORY

SOLUTION for
Industrial Manufacturers



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COSMOS GROUP

Established in 1987, we are now pioneering in the fields of manufacturing and sales of CNC machine tools and accessories, high-precision components, and now we are leading the fourth industrial revolution (Industry 4.0) with our industrial IoT solutions. We cater to the global market through 21 different industry segments.

The Cosmos Group audience can be summarised in four words:
AFFLUENT, LOYAL, INFLUENTIAL & ACTIVE.



Team Strengths
1500+



digiFAC Happy Clients
150+

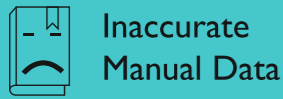


Repeat Orders Ratio
70%

KEY PILLARS



PROBLEM



Inaccurate Manual Data



Boxes of Paper Reports Daily

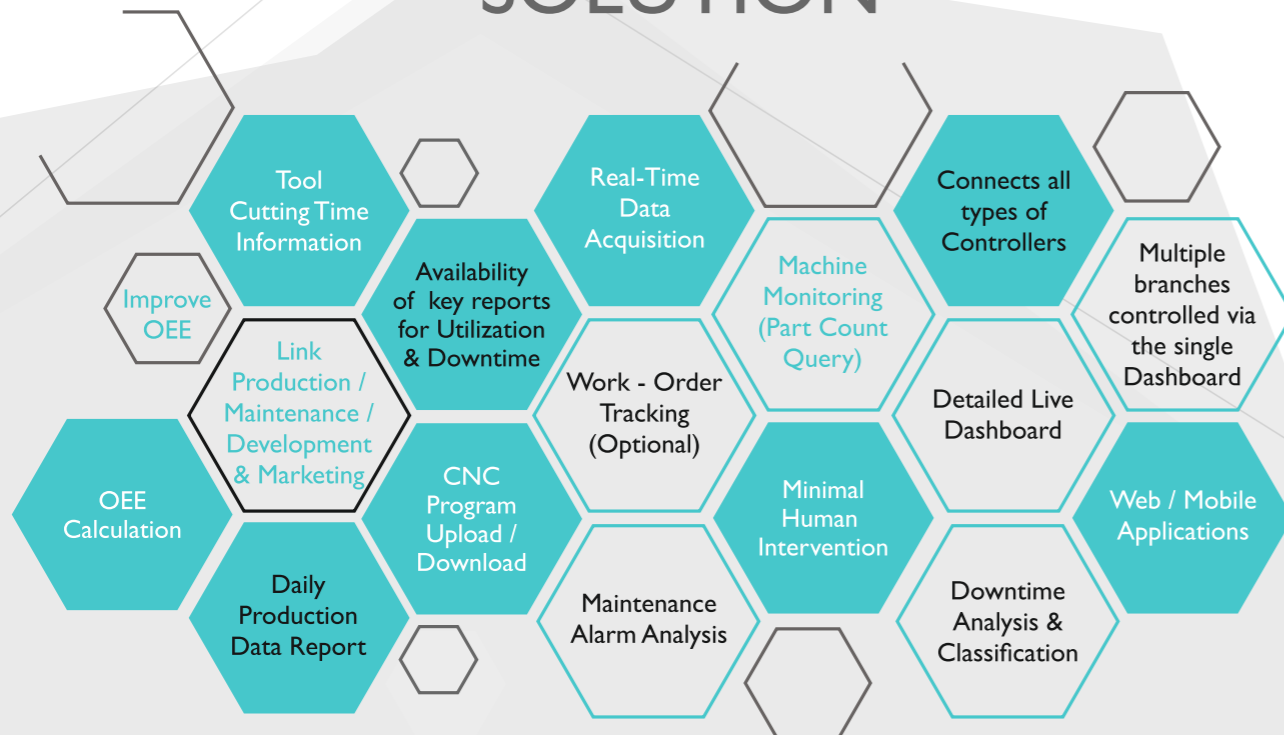


No Real-Time Data Monitoring

SOLUTION

digiFAC

A DIGITAL FACTORY SOLUTION



RESULT



20% Increase in Productivity



99% Data Accuracy



3 Months Return on Investment



25% More efficient programs

What is digiFAC?

The Digital Factory Solution, digiFAC, integrates various signals from all kinds of controller-based machines, including CNCs, injection moulding machines, and press machines, and gives you accurate real-time data with the least amount of human intervention to collect the information directly from the machines. It helps you get the maximum benefit from assets and enhance productivity.



Why is digiFAC?

- Industry-Leading: Production efficiencies and agility.
- Highly expert team members.
- Phenomenal solutions to take your company to the next level.
- User-friendly Interface; use features as per dedicated roles/users.
- Transparent, quick, and real-time data availability that can help you make fast decisions
- To improve OEE.
- Increase your productivity by 20%.
- ROI within 3-4 months.
- To maintain your OTD.
- To reduce lead time, setting time, and deliver on time.

How can the digiFAC improve OEE?

Overall Equipment Effectiveness (OEE) is a measure of machine performance that provides visibility to options for progress. OEE is used by manufacturers to specify, monitor, and then reduce production failures. Knowing the OEE value is important for one particular reason: it allows you to find out about your losses and identify the bottlenecks in your value stream. If you know exactly where you are wasting time on your assets and why this is happening, you can take the necessary actions to improve your overall performance.

- Automate data collection and reporting.
- Imagine and display real-time OEE on the shop floor.
- Execute cross-functional everyday reviews and conversation sessions.
- Use Root-Cause Analysis.

10~25%

An OEE increase is achievable by digitizing production & planning, asset monitoring (cycle-times), reducing losses (program transfer, downtimes, breakdowns), etc.



digiFAC Features



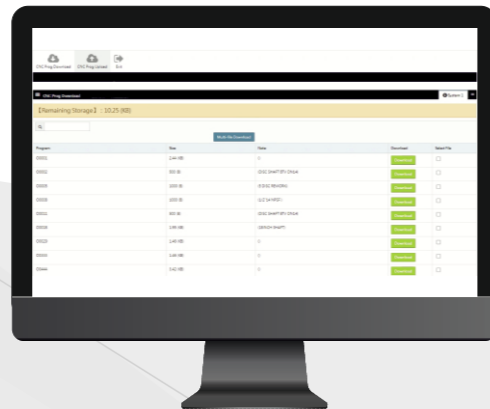
Dashboard Monitoring

- Live information of the entire factory.
- Categorize machines (Unit-wise).
- View regular Utilization of the machine.



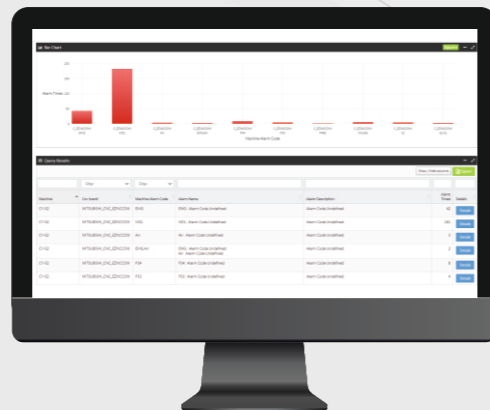
Program Transfer

- Upload programs from computer to machine remotely.
- Download programs & edit them from anywhere around the globe.



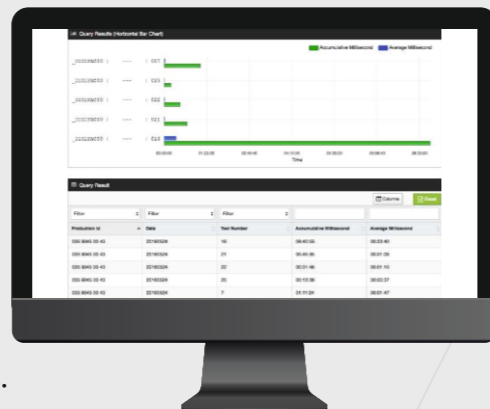
Alarm Analysis

- Alarm History by code/machine.
- Time & duration of all alarms generated by a separate machine.



Tool Cutting Time Information

- No more unidentified dry-runs.
- Program path optimization in-sight.
- Tool usage clarity.
- Shorter cycle-times (if modified).
- Eliminate NVA air time and improve your process.



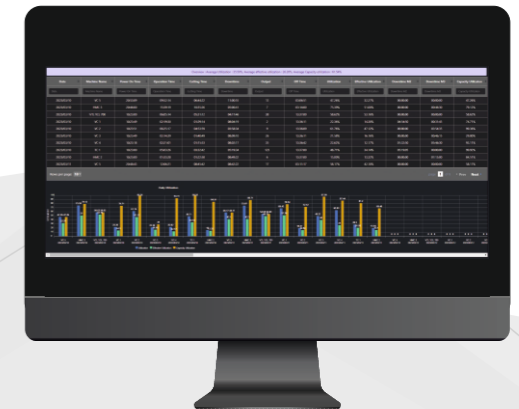
All-in-One Dashboard

- Overview of all data of one machine on one screen.
- Find out the machine's status right away.
- One machine's information is displayed on a single screen.



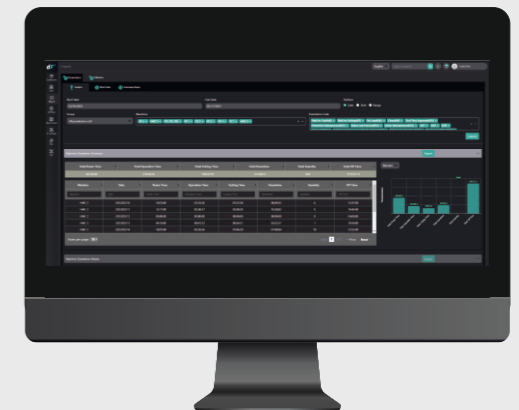
Production Information (Utilization)

- Detailed production information report: An automated daily production report.
- All reports are available in Excel format.



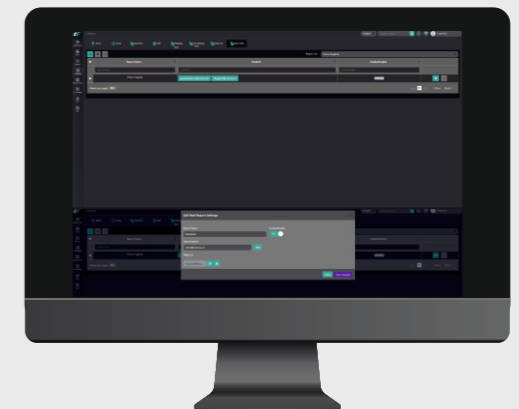
Downtime Analysis

- See total machine downtime.
- Monitor downtime and the reasons for it (Macro Downtime Feature).
- Focus & can easily get the classified major losses/downtimes and work on Optimization.



Email Alerts

- Set a time for machines' idle condition and receive or get alarm notification on email.
- Management Reporting: Receive daily production report and downtime analysis report by email on daily basis.



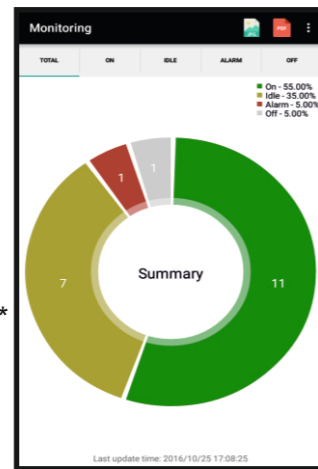
Mobile Application



This is the main screen of mobile application

- Features of our package
- Monitoring
 - Utilization rate analysis
 - Machine Downtime
 - Work order Tracking*
 - Work order downtime*

*optional



Machine Monitoring

- Summary of machine status (Whole factory).
- Alarm notification including the duration of the current alarm & alarm code.
- Monitoring of machine work condition & parameter values.

digiFAC Case Study



Challenges

- Inaccurate Manual Data
- Low Utilization
- More Air-Time Gap
- Inefficient Program
- Low Production rate
- Boxes of paper reports DAILY
- No real-time data monitoring



Solution

- Cosmos - DigiFAC Industry 4.0



Result

- 25% More Efficient Programs
- Effective Utilization Gained up to 7%
- 20% Gained in Production Rate
- 15% Reduction in Downtime
- 99% Data Accuracy with real-time data monitoring

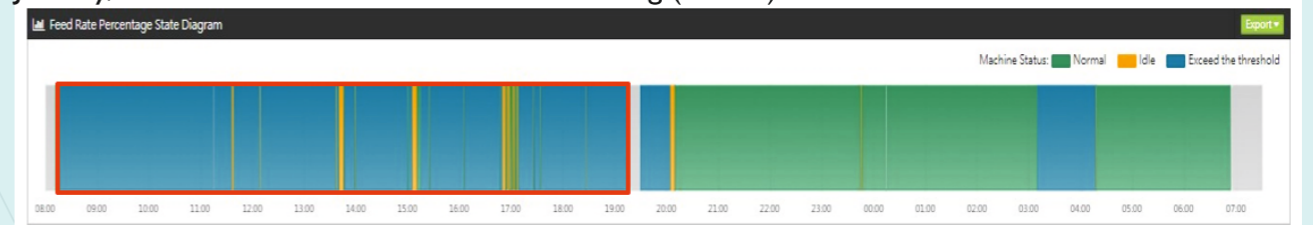
Know exact capacity of your Machine Shop

- We are providing a case study of one of our customers machine shops between January 2021 and March 2021. Earlier, when we were having lots of bottlenecks, like a low production rate with unwanted downtime, our mission was clear: reduce downtime and increase production rate.
- We have compared the data & improved the production with the help of several reports, such as Utilization Analysis, Downtime Analysis, Tool Usage, Feed & Speed Knobbing, and Part Count Query reports.
- Here we have some comparisons between the data reports for January, 2021, and March, 2021.

Feed & Speed

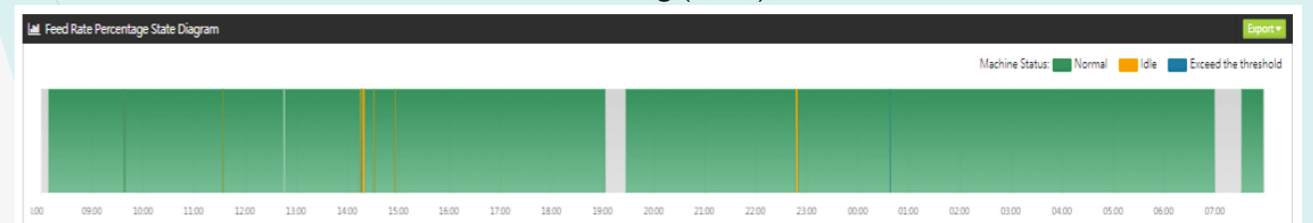
January, 2021

Knobbing (Before)



March, 2021

Knobbing (After)



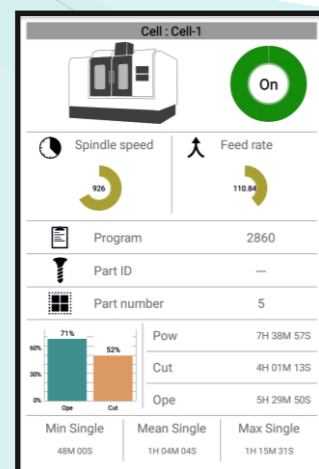
Knobbing on machine is real headache, we have control over feed speed knobbing on machine.

Running Machines

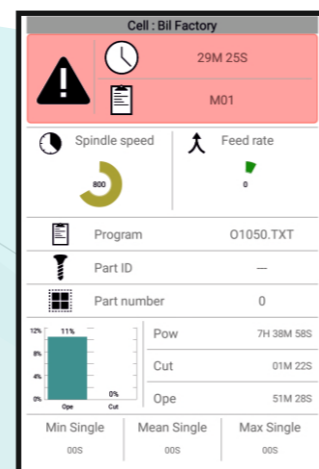
Machine	Utilization	Effective Utilization	Duration
HMC-2	60.0%	42.20%	144:55
VC-14	47.82%	47.46%	24:37
TC-3	46.04%	46.04%	144:55
HMC-3	41.48%	26.85%	44:55
VC-10	61.81%	46.25%	44:55
TC-8	70.32%	64.39%	24:35
VTL-1	65.76%	63.62%	44:35
VTL-2	64.13%	59.72%	144:55

Machine Monitoring

Machine Data (Running)



Machine Data (Alarm)

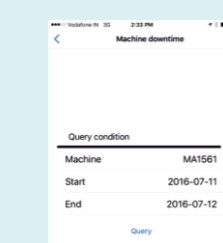


Utilization Analysis / Machine Downtime Analysis

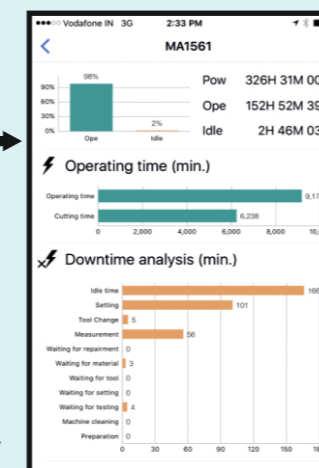
Daily Utilization Report



Monthly Utilization Report



- Analysis of time spent on power on, operating, cutting & idle state.
- Bar-chart including All downtime root causes & their corresponding times.



Utilization Analysis

January, 2021

Average effective utilization rate : 50.80%

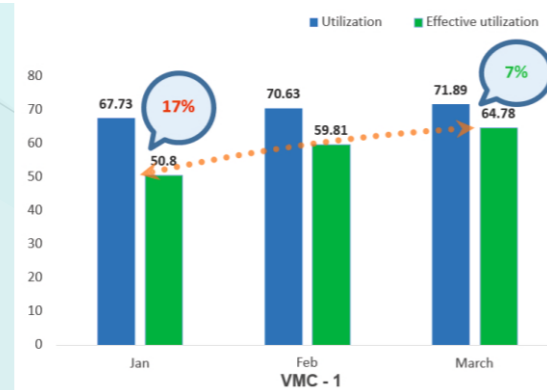
Machine	Date	Power Time	Operation Time	Cutting Time	Downtime	Off Time	Output	Utilization	Effective Utilization	Downtime (M2)	Downtime (M3)	Capacity Utilization
VMC - 1	2021/01	540:55:29	366:21:18	274:48:37	174:34:11	35:05:31	1726	67.73%	50.80%	32:02:05	49:36:10	82.82%

March, 2021

Average effective utilization rate : 64.78%

Machine	Date	Power Time	Operation Time	Cutting Time	Downtime	Off Time	output	Utilization	Effective utilization	Downtime (M2)	Downtime (M3)	Capacity Utilization
VMC - 1	2021/03	539:54:10	388:07:48	349:43:27	151:46:22	60:05:50	2077	71.89%	64.78%	29:34:15	47:28:07	86.16%

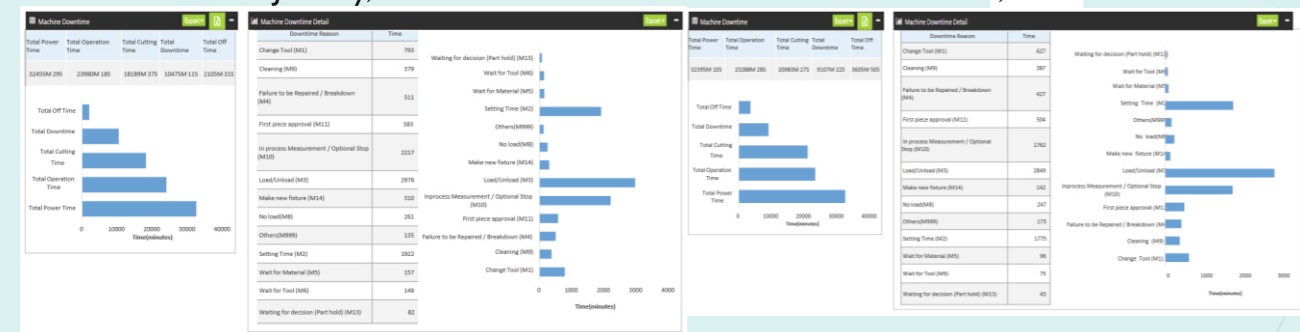
- Utilization for the machine in Jan, Feb and March is 67.73%, 70.63% and 71.89% respectively.
- We have achieved 10% of improvement in Air-Time gap over two months.



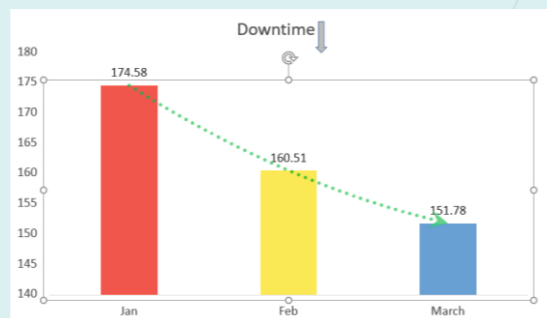
Downtime Analysis

January, 2021

March, 2021



- We have successfully reduced 15% of the downtime from the machine shop.
- we have achieved 23 hours of reduction in downtime over 2 months.



Cycle-Time Reduction

- We have improved the cycle time for a product using the tool usage report.
- We have reduced 26 seconds for one particular tool, Tool was taking 2:27 min initially for one operation; reduction of air time travel by 26 seconds leads us to a reduction in our cycle time, and with reduction in downtime, our cycle time has reduced by 3.33 min per part, and we have got a 20% gain in production.
- Earlier Production Efficiency for this product was 63.57%; by Data analyzing and implementing for two months, we can raise our production efficiency up to 80%.

Tool Usage

Before

Machine	Date	Shift	Program	Tool Number	Start Time	End Time	Power Time	Operation Time	Cutting Time	Downtime
VMC - 1	17/01/2021	B	O7914	11	2021/01/17 17:05:10	2021/01/17 17:07:37	0:02:27	0:02:27	0:01:33	0:00:00
VMC - 1	17/01/2021	B	O7914	11	2021/01/17 17:20:22	2021/01/17 17:22:49	0:02:27	0:02:27	0:01:33	0:00:00
VMC - 1	17/01/2021	B	O7914	11	2021/01/17 17:36:20	2021/01/17 17:38:37	0:02:27	0:02:27	0:01:33	0:00:00
VMC - 1	17/01/2021	B	O7914	11	2021/01/17 17:51:46	2021/01/17 17:54:13	0:02:27	0:02:27	0:01:33	0:00:00

After

Machine	Date	Shift	Program	Tool Number	Start Time	End Time	Power Time	Operation Time	Cutting Time	Downtime
VMC - 1	05/03/2021	A	O7914	11	2021/03/05 10:33:20	2021/03/05 10:35:19	0:01:59	0:01:59	0:01:33	0:00:00
VMC - 1	05/03/2021	A	O7914	11	2021/03/05 10:46:10	2021/03/05 10:48:09	0:01:59	0:01:59	0:01:33	0:00:00
VMC - 1	05/03/2021	A	O7914	11	2021/03/05 10:59:02	2021/03/05 11:01:01	0:01:59	0:01:59	0:01:33	0:00:00
VMC - 1	05/03/2021	A	O7914	11	2021/03/05 11:12:10	2021/03/05 11:14:09	0:01:59	0:01:59	0:01:33	0:00:00

Work Order Tracking

January, 2021

Production Id(N1)	Work Order Id(N2)	Start Time	End Time	Total Power Time	Standard Cycle Time Per Part(N1)	Actual Cycle Time Per Part	Work Time Achievement Rate	Expected Quantity(N8)	Actual Quantity Produced	Production Efficiency
3HT479-14502	2985	2021/01/10 00:33:20	2021/01/18 22:50:32	8540M 12S	12M 00S	18M 48S	63.57%	711	452	63.57%

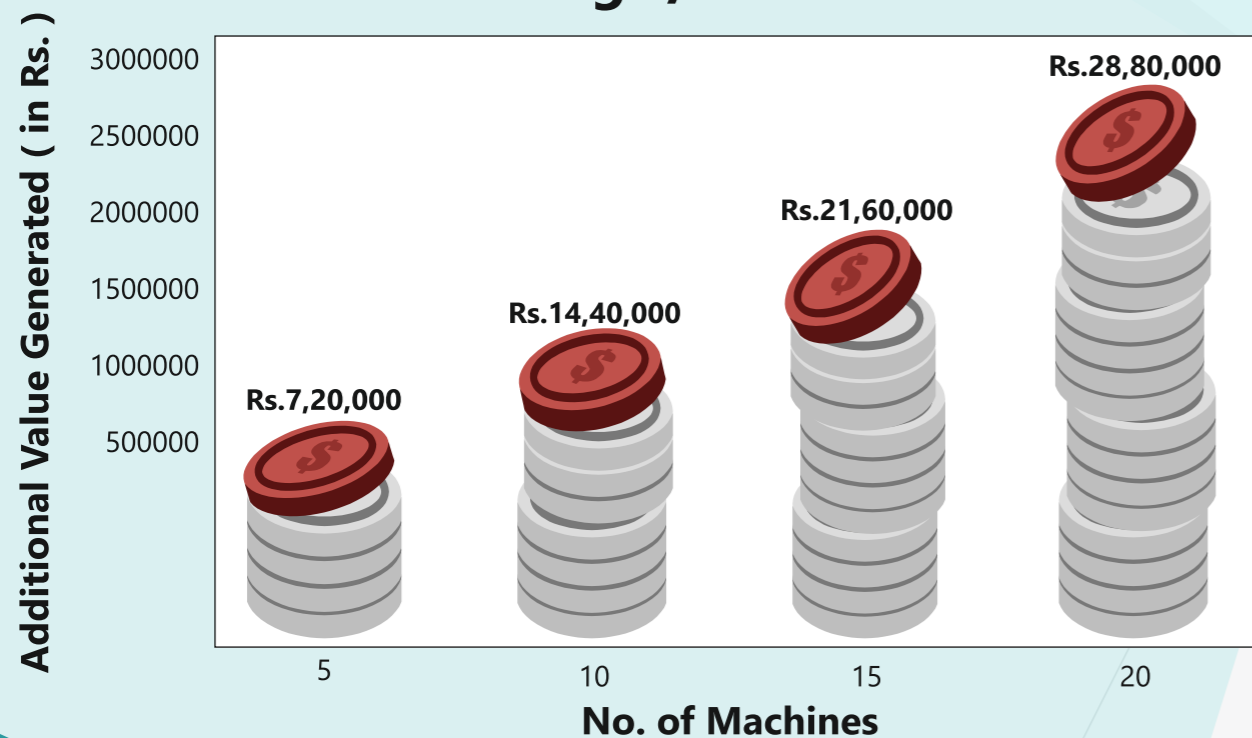
March, 2021

Production Id(N1)	Work Order Id(N2)	Start Time	End Time	Total Power Time	Standard Cycle Time Per Part(N1)	Actual Cycle Time Per Part	Work Time Achievement Rate	Expected Quantity(N8)	Actual Quantity Produced	Production Efficiency
3HT479-14502	2985	2021/03/18 07:05:35	2021/03/23 23:43:45	7120M 10S	12M 00S	15M 15S	80.05%	593	475	80.05%

Result

Here; Factory is using VMC at 3 Shifts / day Average hourly rate realization	= 24 hours = Rs. 400 / hr
Benefit Assumed : 5% of 24 hours	= 1.2 hrs / machine / day = Rs. 400 x 1.2 = Rs. 480 / day
Amount generated in Month (25 Days)	= Rs. 12,000 / month
Assumption for 5 machine :	= Rs. 12000 x 5 machine = 60,000 / month
ROI :	= Rs. 1,80,000 / 3 months
Total Per Year	= Rs. 7,20,000 / 12 months = Rs. 1,44,000 for One Machine

Savings / Year



Plastic Injection Molding Machine Solution

- A single platform where you can see all of your machine's live status, i.e., if it is working, idle, in alarm, or in offline mode.
- More excellent efficiency: Firms will experience minor downtime and improve tracking and tracing.
- Best productivity: It facilitates businesses' ability to deliver better outcomes quickly.
- Via the PIM system, we can get an Alarm notification with span.
- The PIM system can provide a part count with cycle time for each item in detail.
- Timestamp record: we can get a whole time stamp bar chart and a detailed description of the time your machine runs.
- Get everything in a single click, Operation time or Run time, Ideal time, with the standard reason.

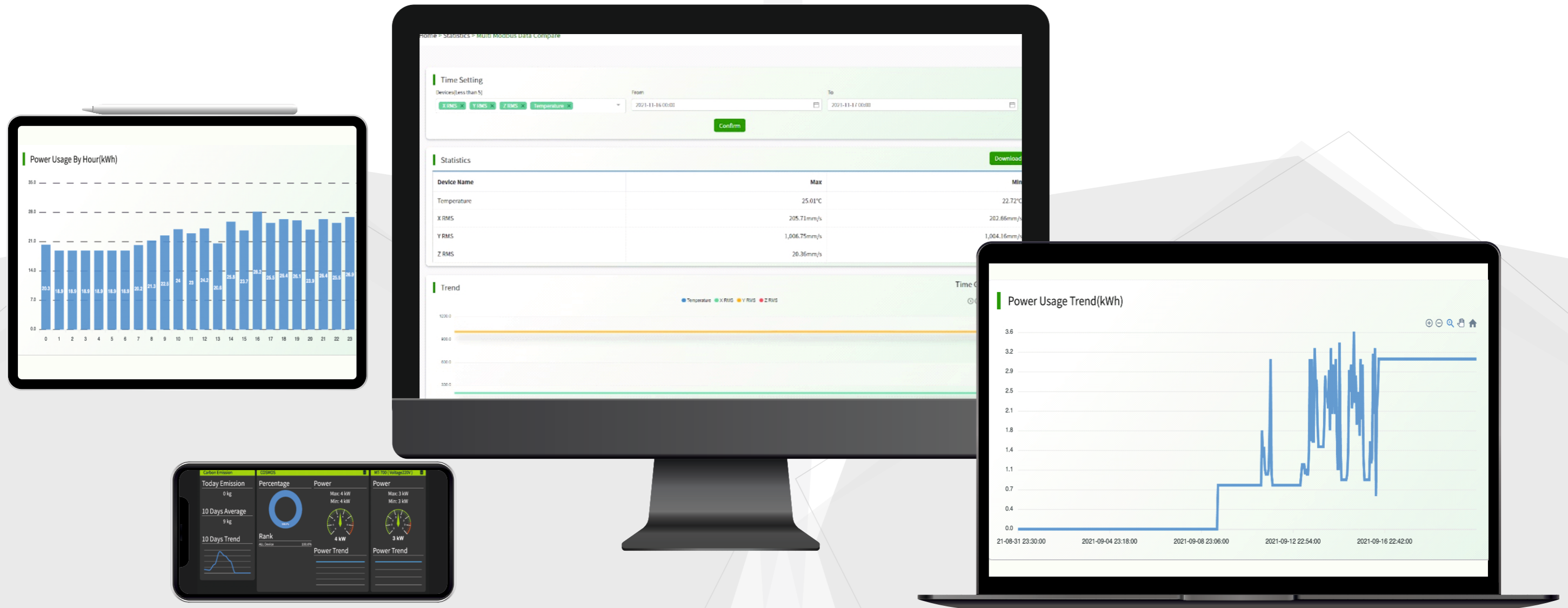


Condition Based Monitoring

- CBM system works through sensors that detect noise and vibrations from the machine.
- Standard classifications of condition-based monitoring include vibration analysis and vibration monitoring, oil analysis, Energy Monitoring, and temperature tracking.
- Unscheduled terminations and faults in the production can be bypassed using the Cosmos CBM multi-functional condition monitoring detectors. These intelligent sensors supply condition data that you can utilize to automate manual examinations. This condition information is valuable for the element of IIoT implementing smart and flexible manufacturing.
- Easy to connect and comfortable integrating via the IO module and LAN.

Condition Based Monitoring Benefits

- Minimizes accidental failure risk & increases the reliability of the assets.
- Provide a real-time alert when specific thresholds are exceeded.
- Real-time monitoring of an asset's health decreases maintenance costs by allowing servicing to be scheduled based on the asset's current fitness.
- Improve manufacturing throughput by decreasing maintenance downtime and unexpected asset downtime.
- Real-time monitoring of assets extends their lifetime by ensuring they are used within the manufacturer's specifications.



Monitoring:



Vibration



pH Level



Temperature



Current & Voltage



Oil Level



Power & Energy

Paperless Factory

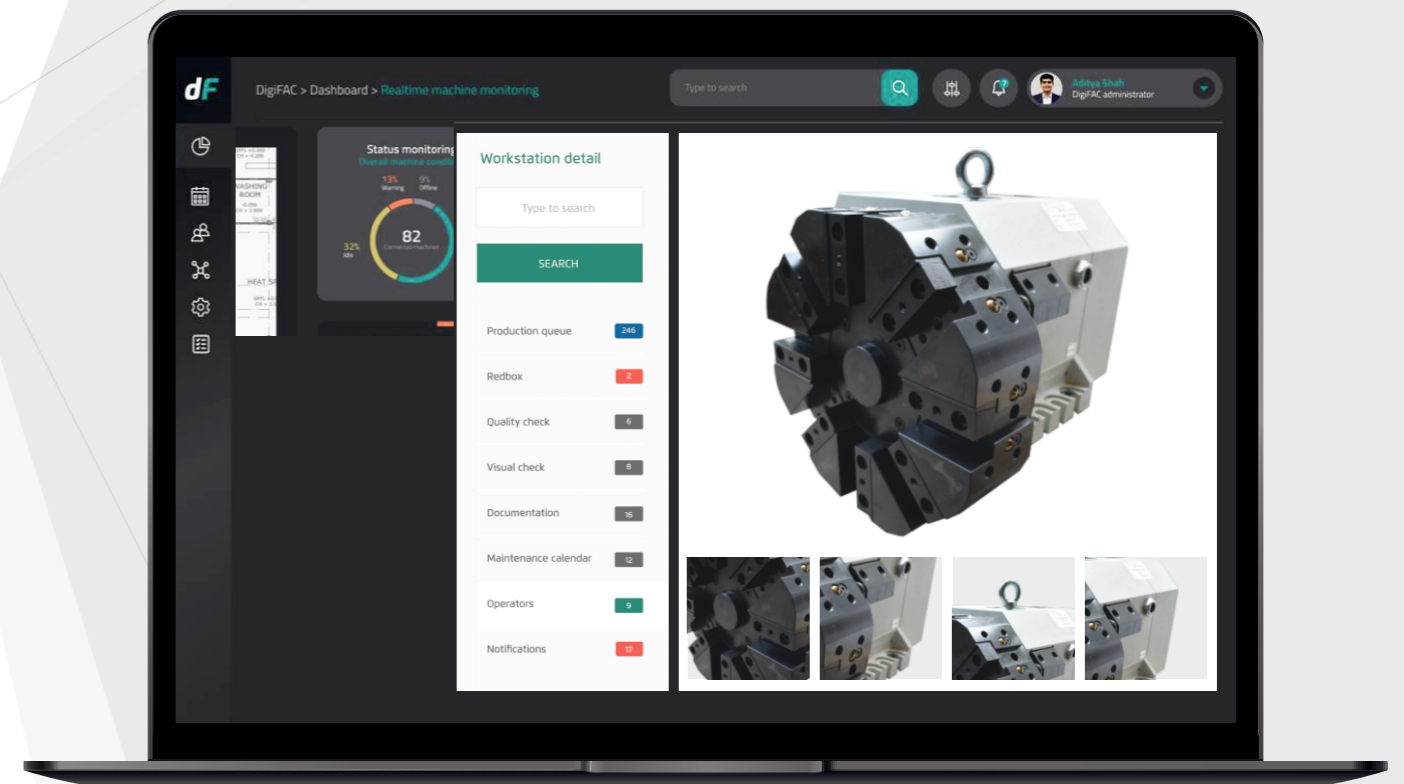
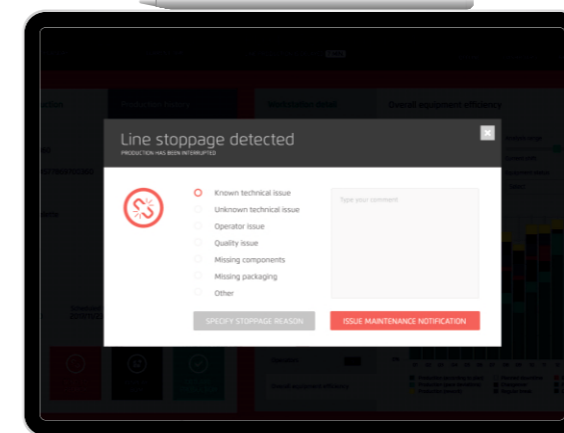
- One of the main attributes of a Smart Paperless factory is eliminating printed documents.
- Digitizing documentation supplies incredible flexibility, reduces mistakes associated with manual data handling, and allows alliances to save time, effort, and funds.
- With the Cosmos Paperless Factory, our customers have been able to eliminate or minimize paper-based documents from their production units. Thanks to this modification, they can handle and view all the documentation online to make conclusions in real time.
- The Cosmos Paperless Factory model replaces traditional paper-based procedures and eliminates paperwork in manufacturing.
- By improving the methodologies and stopping manual entries of record data, it frees the operators from tasks that do not add importance and helps introduce improvements in the operational management of the company.



Paperless Factory Benefits

The paperless factory model connects every component of the shop floor to the manufacturing ecosystem, improves quality control and production efficiency, and also helps to:

- Increased operational flexibility in real-time.
- Cost & Time savings with the data's accuracy.
- Reduce errors in data collection.
- Environment-friendly: We create a better climate for innovation and data sharing in a faster way.
- Paperless factories can be stored in numerous virtual places and have tiered access to details depending on the role and responsibilities.
- One of the keys to any manufacturing facility's success is understanding and studying the shop floor data, and Paperless Factory gives you the data in real time without any delay or loss of accuracy.
- Paperless factories have the benefit that they can consult all types of information linked to the production plant at any time and place.



Plan & Schedule with ERP/SAP Integration

- Planning and scheduling go hand in hand. They are two distinct but crucial aspects of managing work effectively. They need each other in order to achieve maximum results.
- Planning may involve creating a business plan, setting goals for the year, or listing tasks that need to be completed. When you plan, you map out your next course of action.
- The next step involves setting a time-line. It's not enough to identify what needs to be done. It's equally important to figure out when these things need to be accomplished. This is where scheduling comes in. When we talk about scheduling, we're dealing with specific dates and specific time-frames.
- It can be a very daunting task for the entire company, and that's why we're making it easier for you with the Cosmos Planning & Scheduling solution.
- It will help you stay organized in terms of operations by analyzing large volumes of data. It also helps keep your costs under control, makes you prepare for unexpected occurrences, helps you finish your work earlier than expected, and gives you more time for problem-solving.

Planning Screen For Supervisors/Engineers

Priority	New Rework	Plan Date	Shift	Work Center No.	Sales Order No.	Line Item	Pump Type	Production Order No.	Production Order Date	Production Order Qty	Material Code	Material Desc.	Opn Seq. No.	Opn Text
+	New		--Select--		50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	50	SPLIT FACE GRANDIN
+	New		--Select--	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	60	FIRST OPERATION FINI
+	New		--Select--		50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	100	GRINDING_DUBBERIN
+	New		--Select--	06/03	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	10	PILOT HOLE DRILLING
+	New		--Select--	03/01	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	20	1ST OPERATION ROUG
+	New		--Select--	03/01	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	30	2ND OPERATION ROUG
+	New		--Select--		50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	40	UPGRADATION
+	New		--Select--	03/01	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	50	1ST OPERATION FINI
+	New		--Select--	03/01	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	60	2ND OPERATION FINI

Your supervisor can see all the WO has been created just by Login their ID and Password.

Scheduling For Supervisors/Engineers

Priority	New Rework	Plan Date	Shift	Work Center No.	Sales Order No.	Line Item	Pump Type	Production Order No.	Production Order Date	Production Order Qty	Material Code	Material Desc.	Opn Seq. No.	Opn Text
+	New	30/05/2022	--Select--		50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	50	SPLIT FACE GRANDIN
+	New		--Select--	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	60	FIRST OPERATION FINI
+	New		--Select--		50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	100	GRINDING_DUBBERIN
+	New		--Select--	06/03	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	10	PILOT HOLE DRILLING
+	New		--Select--	03/01	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	20	1ST OPERATION ROUG
+	New		--Select--	03/01	50100836	400	500 x 300 KS 80 Pumpset	28000360	21/04/2022	3	PK27021001011ZZ	IMPELLER(K2-04071 011ZZ)	30	2ND OPERATION ROUG

Schedule Chart: Supervisor then can assign a specific plan date, shift and work centre (machines/operation) to a work order/Item.

Plan & Schedule Benefits

- It supports decision-making during complicated business insights, gets real-time details, etc. Via ERP/SAP integration.
- With planning and scheduling, goals become more achievable. If you're prepared with a solid plan and a realistic schedule, your goals will suddenly be more tangible.
- With ERP/SAP integration, the interaction between production, vendors, dealers, and consumers can be better than it used to be.
- Planning and scheduling allow you to stick within a budget. Without a careful plan and timeline, you will definitely go over budget.

Scheduling For Supervisors/Engineers: Assigned WO

Plan Date	Shift	Work Center No.	Sales Order No.	Line Item	Pump Type	Production Order No.	Production Order Date	Production Order Qty	Material Code	Material Desc.	Opn Seq. No.	Opn Text
15/03/2022	A	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	10	MARKING & SPLIT FACE MILLING
15/06/2022	B	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	20	MARKING & SPLIT ASSEMBLY DRILLING_TAPPING
15/08/2022	C	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	30	FIRST OPERATION ROUGH MACHINING
15/07/2022	A	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	40	SECOND ROUGH OPERATION MACHINING
10/05/2022	A	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	70	SECOND FINISH OPERATION MACHINING
14/05/2022	C	11/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	90	MARKING & SLOT MILLING_LUG MACHINING
12/05/2022	B	02/01	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	80	MARKING_DRILLING_TAPPING

Schedule Chart: Supervisor can also see which work order has been already assigned; on which machines and for which date.

Screen For Operators Machine Wise Planned Items!

New Rework	Start Execution	Production Qty	Finish Execution	Rejection Qty	Rejection Reason	Program No.	Plan Date	SD Number	SD Line	Pump Type	Prod. Ord No.	Prod. Ord Date	Prod. Ord Qty	Material Code	Material Desc.	Opn Seq. No.
New Work	Start		Finish		Rejection		18/05/2022	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	70
--Select--	Start		Finish		Rejection		18/05/2022	50100835	100	PUMP Set 200 X 150 DCS	28000034	18/04/2022	1	PD20051005011ZZ	BRG HSG-DE(PD20051005 011ZZ)	80

1. Operators can see the planned items on his machines.
2. He then just has to press 'Start' and 'Finish' by entering the quantity (output) with rejection qty and reason for the rejection