
Productivity & Energy Management System

for Industry, Institutions, Commercial
Buildings etc.

SUMMARY · REPORT · PLAN

Heta Datain

www.hetadain.com

01 Industries that can use this system

Any Industry with (i) Similar Machines (ii) Transfer lines (iii) Manually operated Machines / Lines (iv) Packaging Machines (v) Labour intensive operations

02 Industries / Institutions that can benefit from this System

Any Industry / Institution which has (i) High Energy Bill (ii) High Cooling cost (iii) High Idle time (iv) Low Productivity (v) Cyclic Process

03 Invisible Supervision

The key takeaways are (i) Un-adulterated data on machine status (ii) Traceable indicators to pin-point cause of deviation (iii) Better manpower and quality compliance (iv) Incentives and KPI are measurable.

Who should implement this ?

This is a **TOP DOWN** system

It has to be

- ✓ **conceived**,
- ✓ **approved**,
- ✓ **promoted**, and
- ✓ **monitored**

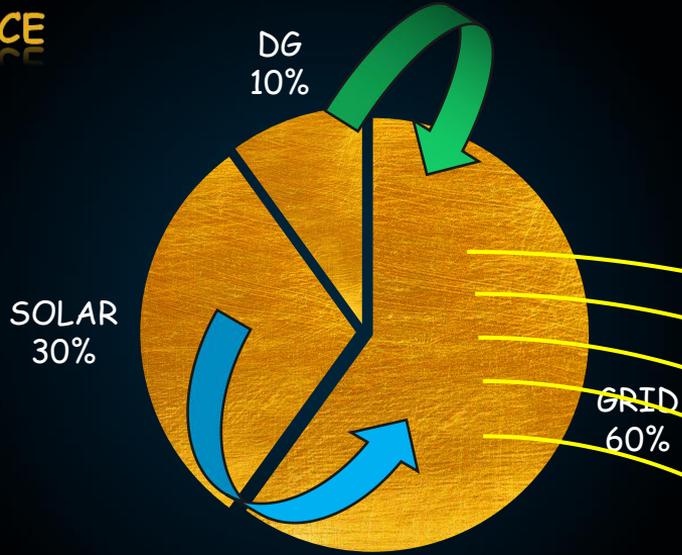
only by the
Higher Management,
and not
Floor Management.

Electrical Energy is sourced from Grid and renewable Energy like Solar / Wind, and consumed by Industry, Institutions, Commercial Buildings like Hospitals, Malls etc for Loads like Machinery, Lighting, Cooling, Pumping, Material Handling Equipment etc. **The Cost of Energy and load varies with Time of Day, and an Optimal Mix and usage is necessary for least cost of Energy and achieve the Key Performance Index (KPI)**

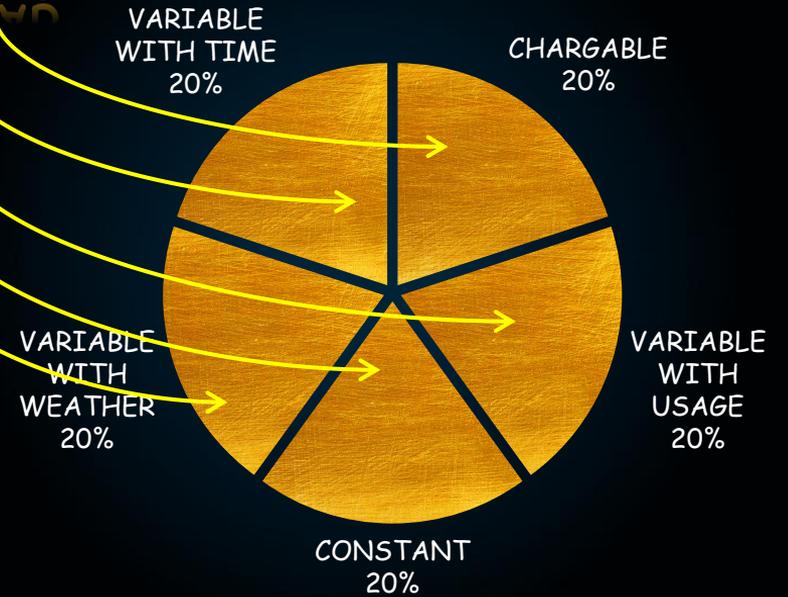
Some Loads are chargeable (Rented out shops / restaurants, ATM), some are constant (corridor and security lights), some vary with usage (Production and Material Handling Machinery, lifts, pumps, fans) some vary with weather (Cooling, Heating) and some vary with time (Street lights, Autoclave)

Measurement of all these Energy Sources and Users every minute gives a DEEP INSIGHT to the trends and consumption patterns. Analysis of this huge DATA generates suggestions for Process Philosophy changes, which saves a lot of Funds for the Client.

SOURCE



LOAD



Summary Of Work

Energy Monitoring

Monitor and log more than 40 Electrical parameters of any Machine or Feeder every minute. This gives a near Real Time graphical display of Energy Flow and Usage on a web based dashboard for analysis, just like a MRI of a Human Body.

Productivity Monitoring

Based on the Electrical parameters logged, any Machine Productivity can be ascertained. Machine Running / Idle and Stop time is determined, and adding Artificial Intelligence to this data can count the actual production in any time frame.

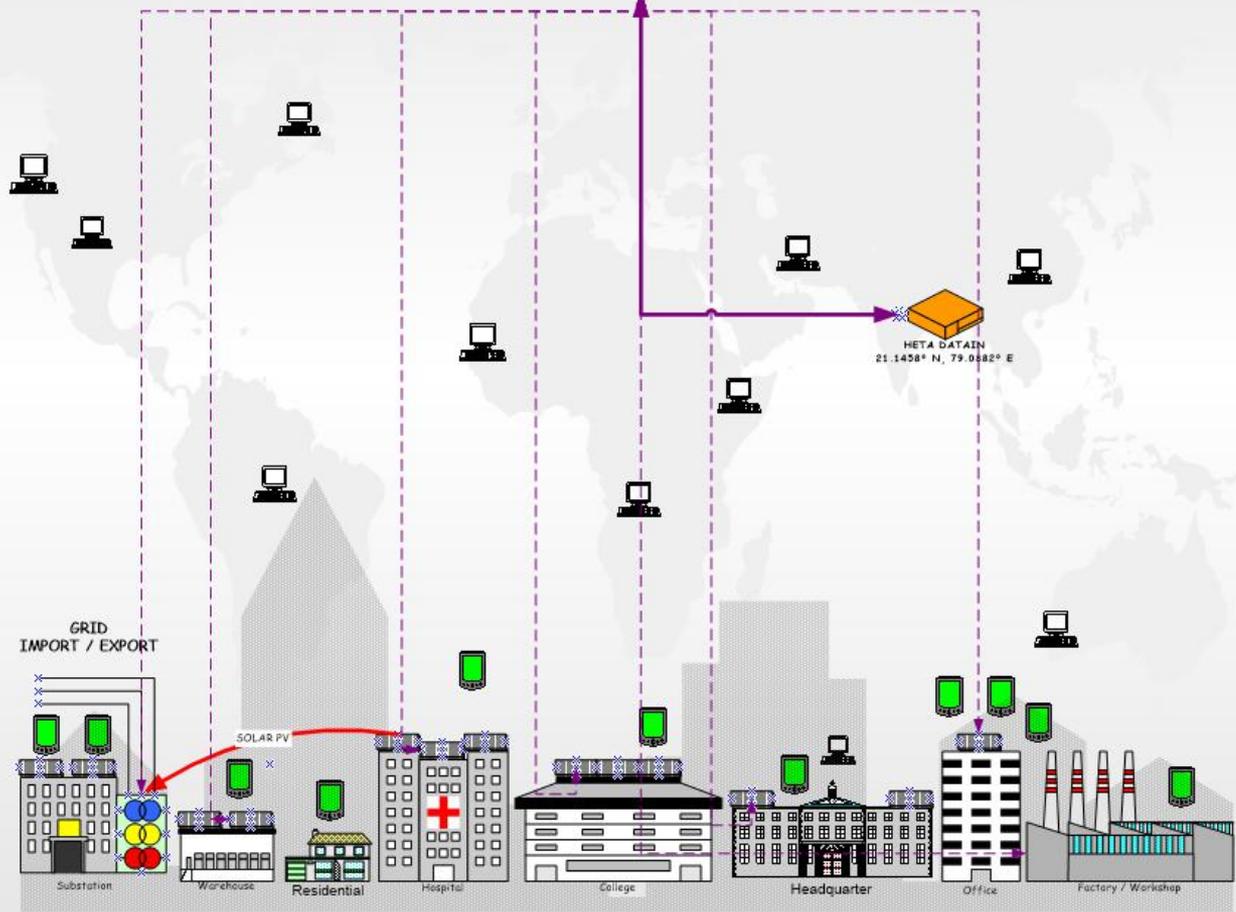
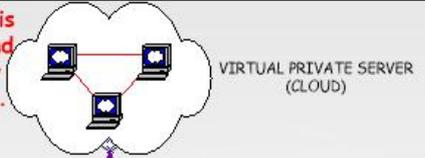
Energy & Productivity Relationship for Efficiency

Once Energy and Machine Productivity is synchronized and linked, a host of relationships emerge like KWH/ Unit of Production, Idle time KWH / unit time, Overdrive / Under-drive of Machine to achieve Production targets, Cycle Time variations during production etc.

The **ADVANTAGES** of doing this are:

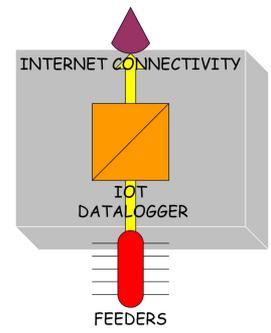
- ✓ **Non-Invasive Data** logging without any outage
- ✓ **Energy usage foot print** in any machine / process gives the Efficiency of Machine / Manpower / Maintenance / and Idle time alerts
- ✓ **Operator's working style and individual efficiency can be tracked on record**, without any manual inputs. Operator's cannot fudge the pre-set cycle time
- ✓ **Quality Controllers and Maintenance Team** get Real time Alerts for faster response, which lessens lesser scrap and breakdown time.
- ✓ **Key Performance Index** (KPI) management
- ✓ All **Management can view these any time** on dashboard on the laptop / mobile.

Electrical Energy and Productivity Data from the USER is uploaded to the Cloud, processed by HETA DATAIN, and published on the web as a Dashboard, which is seen by all Authorised Users anywhere in the world at any time.
 Dashboard updated every 1 / 2 minutes.



Hardware connected at each data point at the user location

1. Non-invasive Transducers for Feeder Electrical parameters
2. Embedded Dataloggers to log / store / and transmit Feeder Electrical parameters
3. Internet connectivity with security



Summary Of Work

We have expertise in **INVISIBLE SUPERVISION** of your Energy Sourcing and Consumption, without taking any outage of the system

We use Embedded Loggers and IOT sensors to upload the **NEAR REAL TIME Electrical data to VIRTUAL PRIVATE SERVER in CLOUD**.

This data is analysed by our team of Energy Auditors from an off-site location, and presented to you on your computer / mobile using a Dashboard updated every minute

Alerts and Reports are given to your Technical team **daily** by Email showing the Energy and Financial trends. This keeps them well informed to take meaningful action.

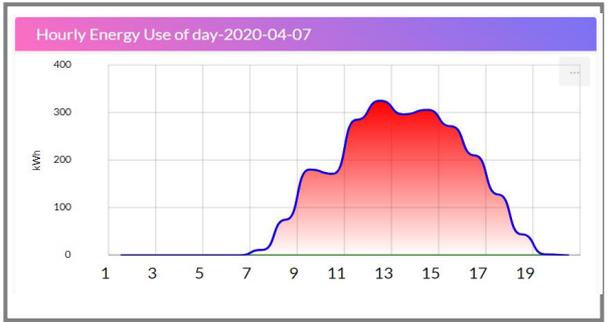
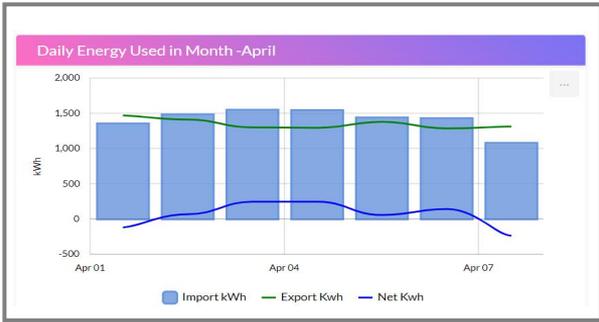
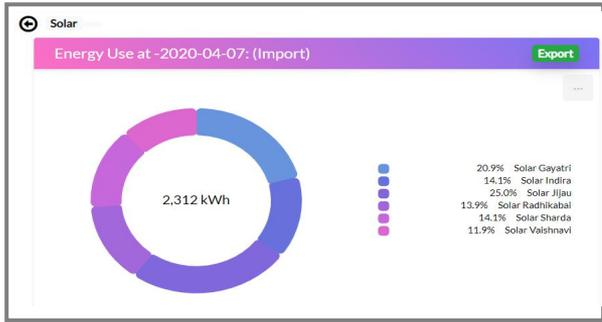
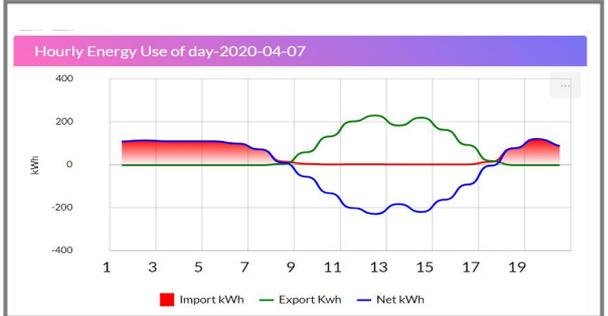
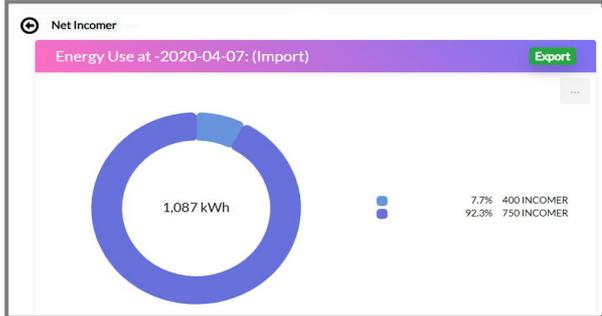
The Management is presented monthly report showing the Area of Concern, Suggestions for better efficiency, and Financial return on investment details.

The **ADVANTAGES** of doing this are:

- ✓ **Un-Adulterated data** available for analysis
- ✓ **No MANPOWER required** for running the system.
- Timely Alerts** on area of concern to take faster remedial action, and thus reduce losses.
- ✓ Management is well informed of Energy Installation Capacity and its Loading, which is useful for future **EXPANSION** of infrastructure.
- ✓ **Energy misuse & Production Cycle time** location is traceable, which can be prevented for quality control and big financial savings.
- ✓ **Microsoft Business Intelligence (BI) Reports**
- ✓ A team of **Energy Auditors** monitor this data for **ONE YEAR**, and give monthly presentations to the Management for improvement

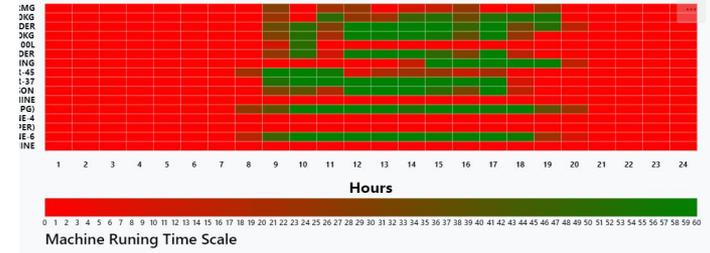
Summary Of Work

A set of GRAPHS shown on the dashboard in Near REAL TIME, updated every minute



Productivity Monitoring

- ✓ Suitable for many similar / sequential / labour intensive machines
- ✓ Running / Stop / Idle time of each machine at any instant
- ✓ Quantity of output in any time frame from each machine
- ✓ Totally non-invasive, and no manpower required to run it.
- ✓ INVISIBLE SUPERVISION



Productivity

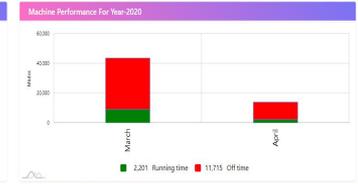
Using Artificial Intelligence and machine Energy parameters

Supervision

Using Energy and Machine parameters

Energy

Real Time Electrical Parameters of each machine are logged



Time Breakup

Using Artificial Intelligence and Energy Parameters

Productivity Monitoring

	1500-KVA															2020-03(March)																				
	kwh by Day and hour																																			
01Mar	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212			
02Mar	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214		
03Mar	172	183	181	185	186	181	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210		
04Mar	147	183	187	186	185	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	
05Mar	100	107	100	106	104	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
06Mar	155	157	146	153	147	150	148	142	148	139	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129	129		
07Mar	184	180	170	187	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	183	180	
08Mar	184	178	171	170	169	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	168	
09Mar	180	180	180	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	
10Mar	140	150	140	140	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
11Mar	90	100	90	100	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	
12Mar	90	100	100	100	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
13Mar	210	180	180	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
14Mar	210	180	180	180	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
15Mar	180	180	180	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
16Mar	180	180	180	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
17Mar	180	180	180	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
18Mar	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
19Mar	400	400	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	
20Mar	90	110	90	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	
21Mar	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
22Mar	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
23Mar	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
24Mar	170	180	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
25Mar	110	110	140	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
26Mar	140	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
27Mar	170	180	180	170	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
28Mar	180	180	170	170	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180

Productivity Energy Report

Select Type: Energy | Select Date: 4/9/2020

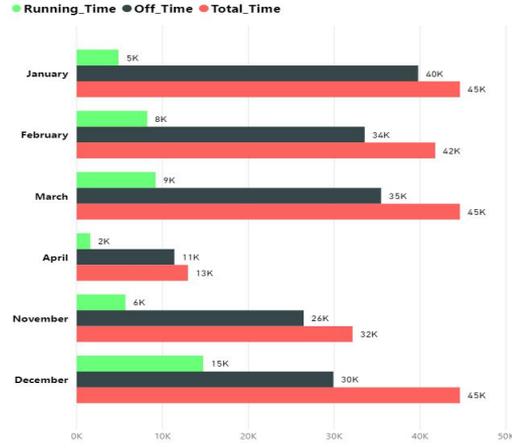
Total Consumption

Name	Today	Yesterday	This Month	This Year
INCOMER	kwh 10499	4302	94109	728069
COOLING	kwh 5816	1480	47460	409628
PRODUCTION	kwh 2603	1048	21430	177741
OTHERS	kwh 1940	1372	17627	126006

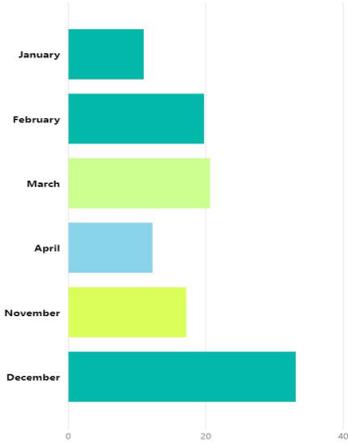
Main Feeders Consumption

Feeders Name	Today(kwh)	Yesterday(kwh)	This Month(kwh)	This Year(kwh)	
INCOMER	1500-KVA	6260	3500	75500	572296
	1000-KVA	2239	802	18809	155773
	FF-CHILLER-PANEL	1697	119	13384	114842

Running_Time, Off_Time and Total_Time by Month



Average of Efficiency by Month



Year	kWh	Max of kWh	Avg of kWh	Min of kWh	INR	Selection
2019	2323777	17900	10,420.52	998	23237770	Apr19
Qtr 1	43413	15169	14,471.00	13639	434130	Mar19
March	43413	15169	14,471.00	13639	434130	Mar19
Qtr 2	550339	17580	13,422.90	998	5503390	Apr19
April	408978	16986	13,632.60	2987	4089780	Apr19
May	106211	15771	11,801.22	998	1062110	May19
June	35150	17580	17,575.00	17570	351500	Jun19
Qtr 3	933210	17900	10,604.66	1840	9332100	Aug19
July	322210	17900	11,933.70	4240	3222100	Jul19
August	299810	12510	9,671.29	1840	2998100	Aug19
September	311190	12640	10,373.00	4250	3111900	Sep19
Qtr 4	796815	12520	8,756.21	2947	7968150	Dec19
October	272570	12520	9,085.67	3530	2725700	Oct19
November	262589	10514	8,752.97	2947	2625890	Nov19
December	261656	10630	8,440.52	3124	2616560	Dec19
2020	817604	14110	8,176.04	1664	8176040	Apr20
Qtr 1	742104	14110	8,154.99	1664	7421040	Feb20

Case Study of a Critical Production Machine

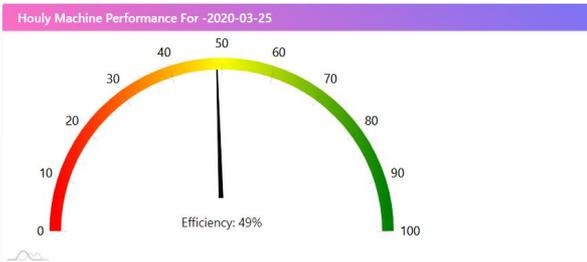
- ✓ A high Priority, high Priced Machine was fed from 4 different processes.
- ✓ This machine was operated by a team of 3 workers, whose synchronization is very important. This machine only works in 1 shift due to quality issues
- ✓ Production was low, due to bottleneck in 4 feeding processes, and non-sync of the workers. When it ran, the machine parameters were manually adjusted to give higher output, but rejects increased substantially.
- ✓ The End of Day meeting was a Blame Game scenario, repeated daily.
- ✓ After this system was installed, all the 4 processes and the 3 workers synchronized, because the Management could pin-point the cause in near Real Time, and take corrective action, and not post-mortem. The end of day scenario was a thing of past.

Year	Running Time	Off Time	Total Time	Avg of Eff
Qtr 1	22275	108766	131031	17.03
January	4867	39774	44640	10.94
February	8224	33538	41758	19.72
March	9184	35454	44633	20.61

Performance improvement by Invisible Supervision:

From a 10.94% running time in January 2020 to 20.61 average running time by March 2020, the efficiency increase has doubled. Theoretical maximum efficiency achievable is 25.8%

Return on Investment was less than 2 months



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