Case Study: Enhancing Productivity, Efficiency, and Reducing Operational Costs in Automotive Accessories Manufacturing

Executive Summary

This case study highlights the transformative impact of our Monitoring and Analysis System (MASS) on productivity, cost efficiency, and operational effectiveness at an automotive accessories manufacturing company. Specializing in producing critical components such as tubular parts, aluminium castings, and truck and bus seats, the company leveraged MASS to achieve a **40% boost in productivity**, a **20% reduction in cycle times**, and a **34% decrease in overtime costs**. The system also enabled effective asset management, efficient production planning, and real-time machine efficiency monitoring.

Introduction

The automotive accessories manufacturing company is a key supplier of critical components such as tubular parts, aluminium castings, and truck and bus seats. Increasing market demand, coupled with stringent delivery schedules, posed significant challenges in maintaining productivity, reducing costs, and optimizing operational efficiency.

The Problem

The company faced several operational bottlenecks, including:

1. **Low Productivity**: Inefficient processes resulted in delays and reduced output.
2. **Extended Cycle Times**: Prolonged production cycles for key components hindered delivery timelines.
3. **High Operational Costs**: Machine breakdowns, unplanned downtime, and reliance on overtime escalated expenses.
4. **Absence of Real-Time Monitoring**: Lack of visibility into machine performance made it difficult to identify inefficiencies or plan maintenance.
5. **Inefficient Production Planning**: Manual scheduling led to frequent adjustments and disrupted workflows.
6. **Asset Management Challenges**: High demand and tight schedules prompted frequent requests for new machines.

The Solution

MASS was designed to address these challenges with advanced features, including:

- **Productivity Monitoring**: A real-time dashboard offering insights into production output and bottlenecks.
- **Cycle Time Analysis**: Automated data collection to identify inefficiencies and provide actionable recommendations.
- **Machine Efficiency Tracking**: Monitoring of key performance metrics, such as Overall Equipment Effectiveness (OEE).
- **Cost Reduction Tools**: Planned preventive maintenance and workload balancing to minimize downtime and reduce overtime costs.
- **Asset Management Support**: Data-driven insights that eliminated the need for additional machines during peak demand.

Implementation

The implementation of MASS was strategically phased over three months:

1. **Assessment**: An in-depth analysis of existing processes identified key areas for improvement.
2. **Integration**: Hardware and software systems were installed to enable seamless data collection and analysis.
3. **Training**: Workshops equipped employees with the skills needed to utilize the system effectively.
4. **Testing**: Pilot projects were conducted on specific machines, such as welding stations, before scaling across the factory.

Initial challenges, such as resistance to change and data inconsistencies, were addressed through enhanced training sessions and iterative system refinements.

Results

After six months of implementation, MASS delivered impressive results:

1. **Improved Productivity**:
    - **Before**: 5,000 strokes/day.
    - **After**: 7,140 strokes/day (**+40%**).
2. **Cycle Time Reduction**:
    - **Before**: Average cycle time: 19 minutes.
    - **After**: Average cycle time: 15 minutes (**-20%**).
3. **Machine Efficiency**:
    - **Before**: OEE averaged 60%.
    - **After**: OEE increased to 81%.
4. **Cost Savings**:
    - Annual operational cost reduced by **₹48 lakhs** through lower overtime and minimized downtime.
    - Additional savings achieved by avoiding the purchase of new machines during peak production.
5. **Efficient Production Planning**:

- Rescheduling reduced by 40%, ensuring consistent on-time delivery.

Lessons Learned

1. **Data Accuracy is Paramount**: Ensuring high-quality data inputs was critical for the system's success.
2. **Employee Buy-In is Essential**: Comprehensive training and engagement significantly improved adoption.
3. **Scalability Offers Greater Potential**: MASS can be scaled to other units or departments for broader impact.

Conclusion

The implementation of MASS revolutionized operations at the automotive accessories manufacturing company. By addressing key challenges and delivering measurable benefits, the system set a new benchmark for productivity, efficiency, and cost management. Additionally, MASS provided visibility into previously untraceable issues, enabling data-driven decision-making and long-term operational resilience.

Call to Action

Discover how MASS can transform your manufacturing processes. Contact us at **priya@utindia.in** for more information or to schedule a demo.

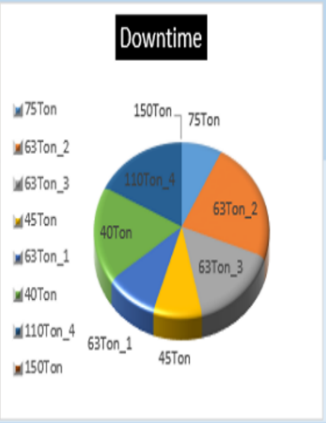
System Overview

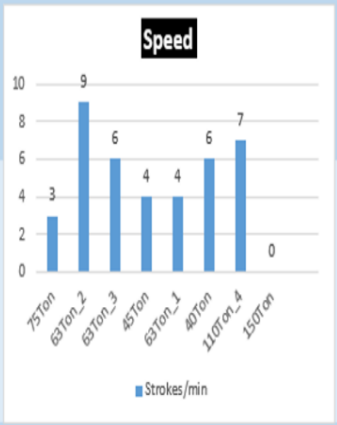
Central dashboard

Generate Summary | Historic Report | Default Layout

MC-1 | MC-2 | MC-3 | MC-4 | MC-5 | MC-6 | MC-7 | MC-8

Machine Name	Date	No. of Stoppages	Downtime	Strokes	Strokes/mir
75Ton	10/5/2024	22	03:48	1997	3
63Ton_2	10/5/2024	9	01:20	5865	9
63Ton_3	10/5/2024	10	02:05	4067	6
45Ton	10/5/2024	12	03:45	2286	4
63Ton_1	10/5/2024	12	03:53	2437	4
40Ton	10/5/2024	13	01:42	4596	6
110Ton_4	10/5/2024	13	02:21	4501	7
150Ton	10/5/2024	0	07:39	0	0





Index	Date	Started At	Stopped At	Downtime	Reason
1	10/5/2024	14:37:28	13:35:18	01:02:10	
2	10/5/2024	12:40:53	11:57:16	00:43:36	
3	10/5/2024	15:14:15	14:37:29	00:36:46	
4	10/5/2024	11:28:09	11:03:40	00:24:29	
5	10/5/2024	13:01:07	12:40:54	00:20:13	
6	10/5/2024	10:19:16	10:01:28	00:17:48	
7	10/5/2024	08:11:31	08:00:00	00:11:31	
8	10/5/2024	09:26:16	09:16:14	00:10:01	
9	10/5/2024	13:13:57	13:04:38	00:09:19	
10	10/5/2024	08:28:34	08:22:15	00:06:18	
11	10/5/2024	09:04:20	09:00:21	00:03:59	
12	10/5/2024	15:20:34	15:16:45	00:03:49	
13	10/5/2024	15:34:41	15:30:53	00:03:47	
14	10/5/2024	13:22:49	13:19:34	00:03:14	
15	10/5/2024	16:30:00	16:27:09	00:02:50	
16	10/5/2024	13:17:00	13:14:20	00:02:39	
17	10/5/2024	13:34:58	13:32:25	00:02:32	
18	10/5/2024	13:03:31	13:01:08	00:02:23	
19	10/5/2024	15:53:01	15:50:43	00:02:18	
20	10/5/2024	15:22:50	15:20:34	00:02:16	

Top 20 downtime reason for machine-1

Hourly Dashboard

75Ton

10/5/2024

No. of stoppages 19 Total Downtime 3:48:20 AM

Time Hour	DownTime	Stoppages	Strokes	Strokes/min	Strokes/eff. min	Efficiency in %
8AM to 9AM	0:22:12	4	458	8	12	12.72
9AM to 10AM	0:14:00	2	619	10	13	17.19
10AM to 11AM	0:17:48	1	397	7	9	11.03
11AM to 12AM	0:27:13	2	304	5	9	8.44
12AM to 1PM	0:29:59	0	1	0	60	0.06
1PM to 2PM	0:44:52	6	81	1	5	2.25
2PM to 3PM	0:59:59	0	1	0	60	0.03
3PM to 4PM	0:28:27	3	212	4	7	5.89
4PM to 5PM	0:32:51	1	215	4	8	5.97
5PM to 6PM	0:59:55	0	0	--	0	--
6PM to 7PM	0:59:55	0	0	--	0	--
7PM to 8PM	0:59:55	0	0	--	0	--
8PM to 9PM				--	0	--

Detailed Dashboard

63Ton_2

Nos. Of Stoppage 9 Total Downtime 01:20:55

Date	Stopped At	Started At	Downtime	Strokes	Speed
10/5/2024	8:00:00 AM	8:00:00 AM	00:00:00	0	0
10/5/2024	8:00:00 AM	8:09:16 AM	00:09:16	1	0
10/5/2024	9:03:11 AM	9:13:55 AM	00:10:44	929	13
10/5/2024	10:01:23 AM	10:23:15 AM	00:21:51	1801	13
10/5/2024	11:12:11 AM	11:22:32 AM	00:10:21	2658	13
10/5/2024	11:59:07 AM	12:30:18 PM	00:31:10	3314	12
10/5/2024	1:28:46 PM	1:37:30 PM	00:08:44	4353	13
10/5/2024	2:24:28 PM	2:38:26 PM	00:13:57	5129	13
10/5/2024	3:06:13 PM	3:19:09 PM	00:12:56	5617	13
10/5/2024	3:32:36 PM	3:40:47 PM	00:08:11	5865	13
10/5/2024	4:26:14 PM	4:30:00 PM	00:03:45	0	9

Here, with the help of data , one can find the following points...

1. Shift start time was 8:00:00 Am but machine started with 9 mins delay.
2. Shift end time was 4:30, machine stopped 4 mins before the planned time.
3. Total downtime for this machine was 1hour 20mins 55 secs more than planned downtime.
4. All other stoppages info which were more than 3 mins.

Report

Date	HB-1	HB-2	HB-3	HB-4	HB-5	HB-6	HB-7	HB-8
01-01-2025	01:24	01:51	01:40	01:40	07:40	00:58	02:26	01:34
02-01-2025	00:28	02:10	01:27	01:39	07:39	00:52	04:27	03:33
03-01-2025	05:59	07:40	01:19	06:00	07:40	02:22	03:34	03:37
04-01-2025	08:54	09:13	09:04	02:01	07:39	01:10	05:00	05:48
05-01-2025	07:15	07:09	01:53	06:36	07:39	01:50	07:39	03:06
06-01-2025	01:03	02:52	01:49	02:41	07:40	01:17	02:56	02:22
07-01-2025	00:46	02:42	01:48	01:46	07:39	02:52	03:04	02:34
08-01-2025	02:40	05:01	02:54	07:07	07:40	03:07	06:00	07:21
09-01-2025	02:21	04:59	02:56	08:15	07:39	01:52	07:10	06:35
10-01-2025	07:40	07:40	03:11	07:40	07:40	01:44	07:25	03:18
11-01-2025	01:09	01:19	01:18	01:16	07:39	01:37	03:22	03:35
12-01-2025	00:40	02:12	02:06	02:16	07:39	01:52	03:20	03:08
13-01-2025	02:59	03:43	02:02	02:16	07:40	02:44	03:47	04:03
14-01-2025	03:07	03:32	01:39	01:50	07:40	02:04	04:31	04:31
15-01-2025	09:02	08:13	07:39	10:20	07:39	07:37	08:44	09:41
16-01-2025	05:04	06:45	02:05	09:18	07:40	03:03	05:00	06:03
17-01-2025	00:10	00:00	00:00	00:16	00:00	00:00	00:18	00:06
18-01-2025	00:26	02:01	00:21	00:14	00:13	00:05	01:57	01:24
19-01-2025	03:11	04:29	02:24	02:23	02:41	03:28	03:01	02:56
20-01-2025	01:16	04:39	01:38	01:29	02:22	01:31	04:13	04:18
21-01-2025	01:08	04:31	01:32	01:46	01:09	02:41	03:16	03:58
22-01-2025	01:06	02:52	03:37	07:39	02:13	02:53	03:47	05:31
23-01-2025	01:22	04:22	02:27	01:37	01:22	03:16	03:31	03:42
24-01-2025	01:01	05:12	01:25	01:27	02:18	03:41	03:47	04:03
25-01-2025	01:08	06:40	00:48	01:05	02:26	02:55	04:16	03:57
26-01-2025	04:34	04:34	04:34	04:34	04:34	04:34	04:34	04:34
27-01-2025	01:08	02:42	02:23	05:31	01:43	02:27	07:03	02:52
28-01-2025	01:30	00:45	00:11	00:00	00:23	00:42	01:17	00:29