I4

NEXT GENERATION

MILLING SYSTEMS

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The Journey Through Industry 5.0

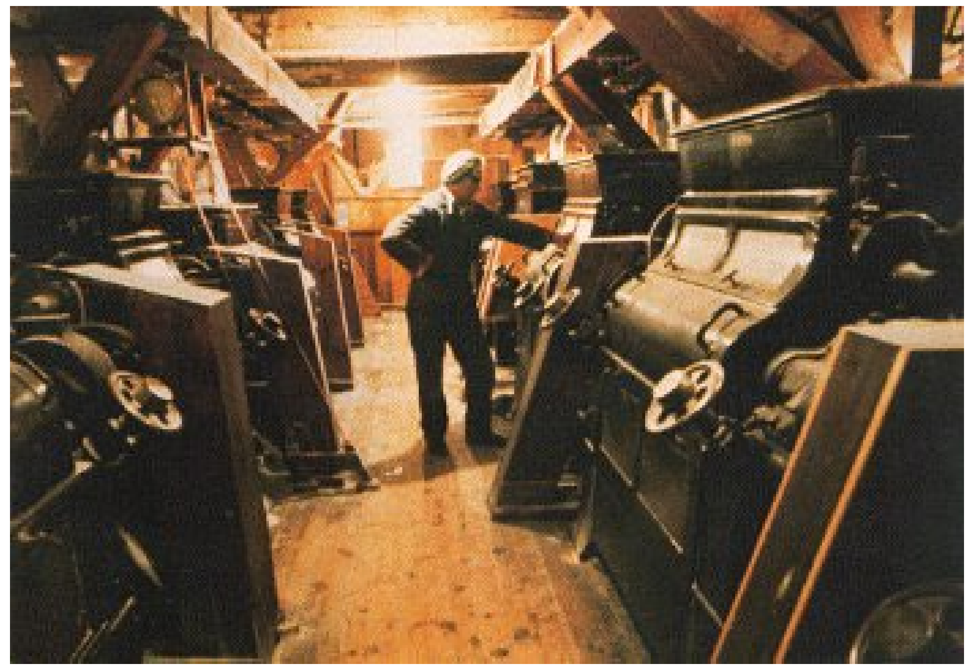
1800’s — **Industry 1.0**
Mechanisation (Water and Steam Power)

1900’s — **Industry 2.0**
Serial Production (Electric Power)

2000’s — **Industry 3.0**
Automation (Computerizing)

2011’s — **Industry 4.0**
Digitalisation (Internet Technologies) and Artificial Intelligence

2100’s — **Industry 5.0**
Humanless Technologies



I4: The Next Generation Milling Technology / Lights-out Factory

<u>OUR MAIN AIM</u>

Alapala presents I4 – Next Generation Milling Systems, which provides the ability for machines to operate <u>self-dependent and error proof without any human interaction.</u>

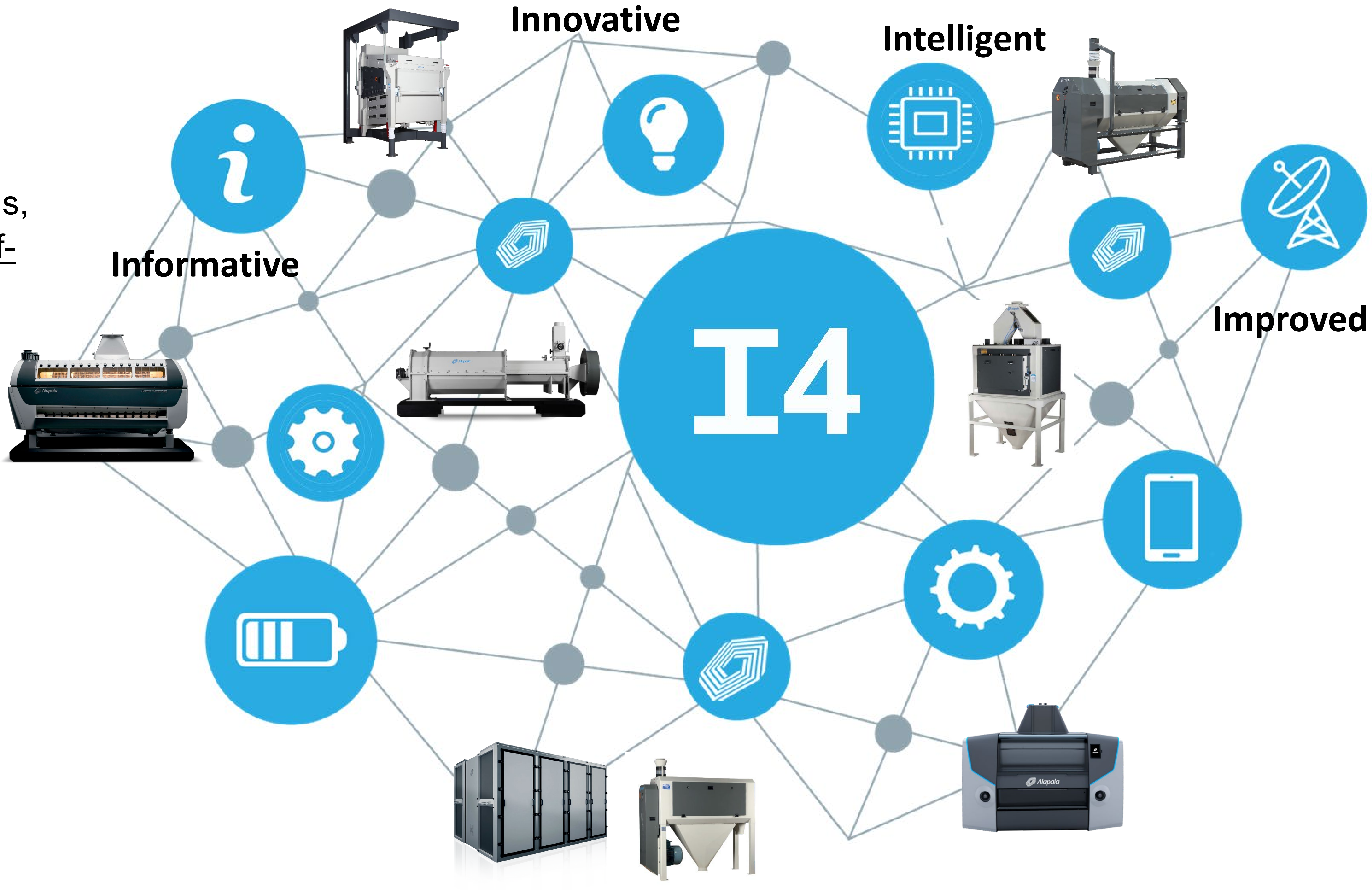
We developed the world's next generation milling technology which provides:

1/Consistent Quality

2/High Reliability

3/Optimized /Energy Efficient Process

4/Minimum Human Intervention



Technology

USING TECHNOLOGY

IIoT (Industrial Internet of Things)
enables machines, systems, and even plants to connect and communicate with each other

Sensors
Higher reliability of machines and closer control on process parameters

Algorithms
Autonomous Operation with a ‘*Reactive to Adaptive’ Automation System*

Automation System

BASICS OF SYSTEM

Implementing the **Jidoka** (intelligent automation) approach into flour milling, we have developed a semi-autonomous system based on function blocks and sequential processes.

The automation system has self-decision, which is able to:

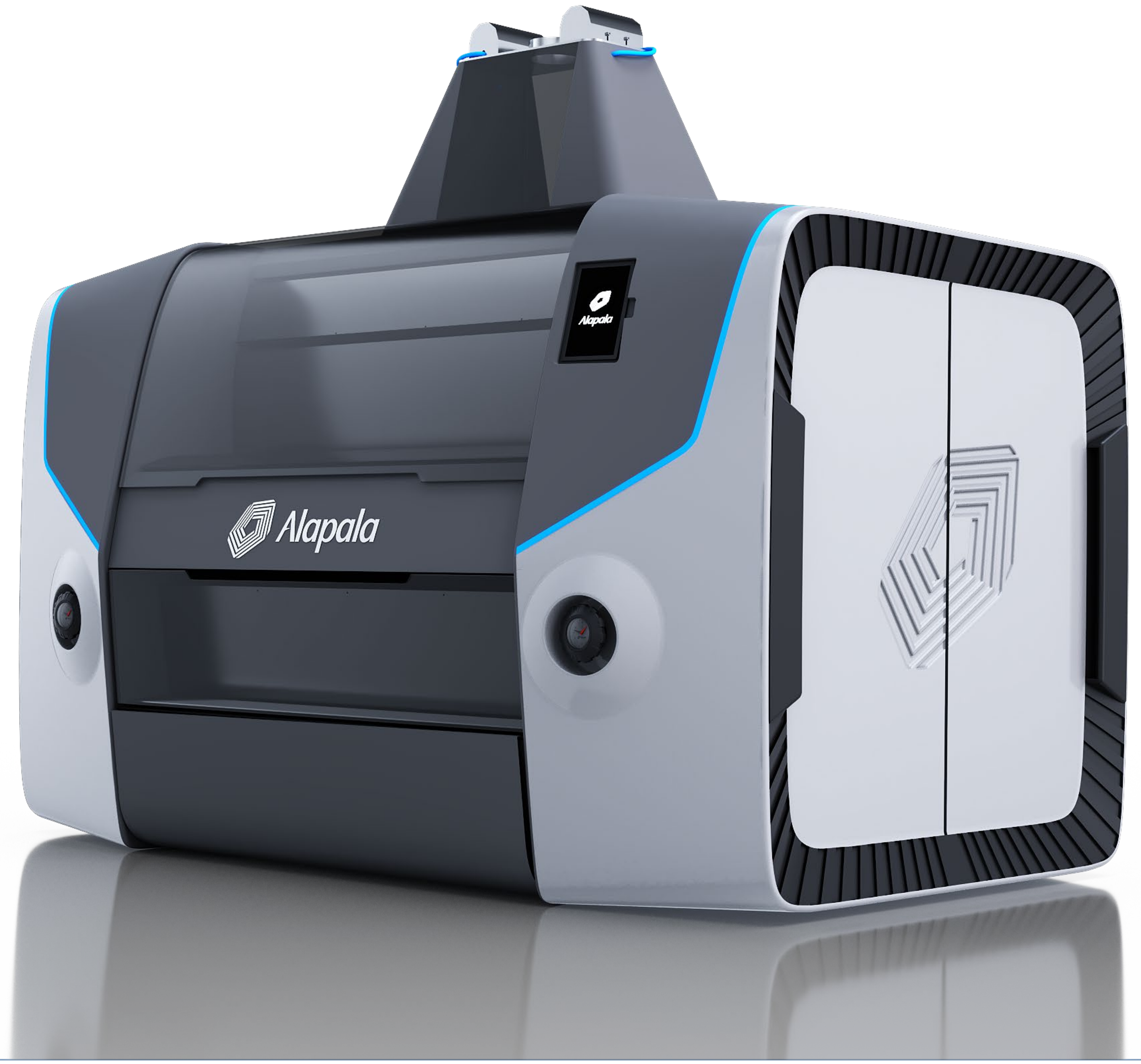
Machines detect/prevent abnormalities

Authorized system for “Stop the Line in Operation”

Automation System

Transforming the System: Reactive to Adaptive

- Finding/detecting the abnormality
- Fixing the problem and solving the root cause without operator touch
- Adapting new conditions to the system
- Sending notification for information if necessary operator intervention



Automation System – *How to React if not be solved by itself*

For this approach, the plant automation system is programmed by using defined **Abnormality Cause Effect Classification** according to Severity and Effect degrees (case-reaction) by using many years experience and know-how of Alapala.

'Abnormality Cause Effect' Classification

By-Pass

Stop Machine

Stop Whole Plant

Call Operator

Principles

Machine Operating Parameters
by sensors

Process Parameters
by sampling and further analysis devices

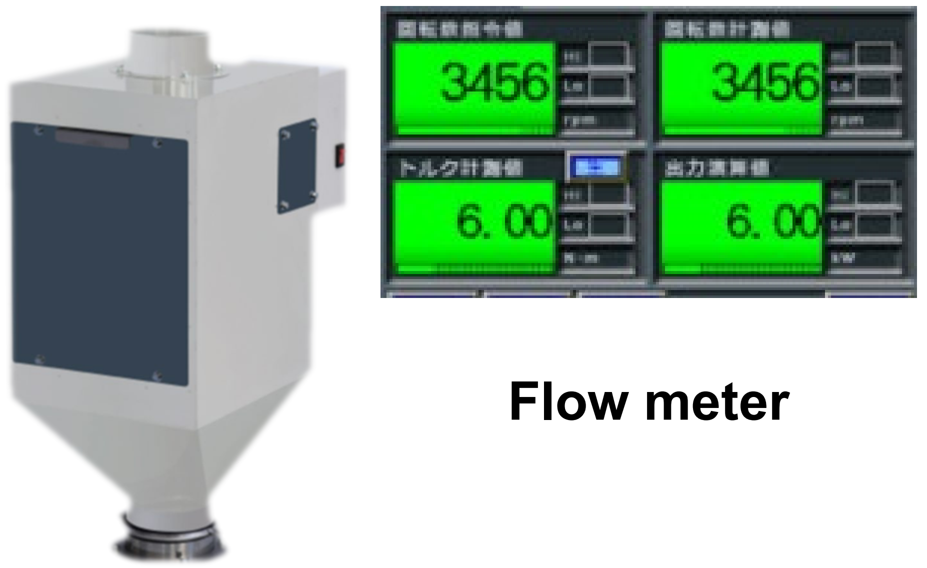
Product Specifications
by Online NIR

Real Time

Process Monitoring System

allowing remote control

IIOT TECHNOLOGY including sensors that are our eyes on process monitoring and reacting for machines /equipments paramaters, process parameters and product parameters; and achieved to have **I4 Milling System** which operates without human touch.



Flow meter

NIR Ingredient analyzer

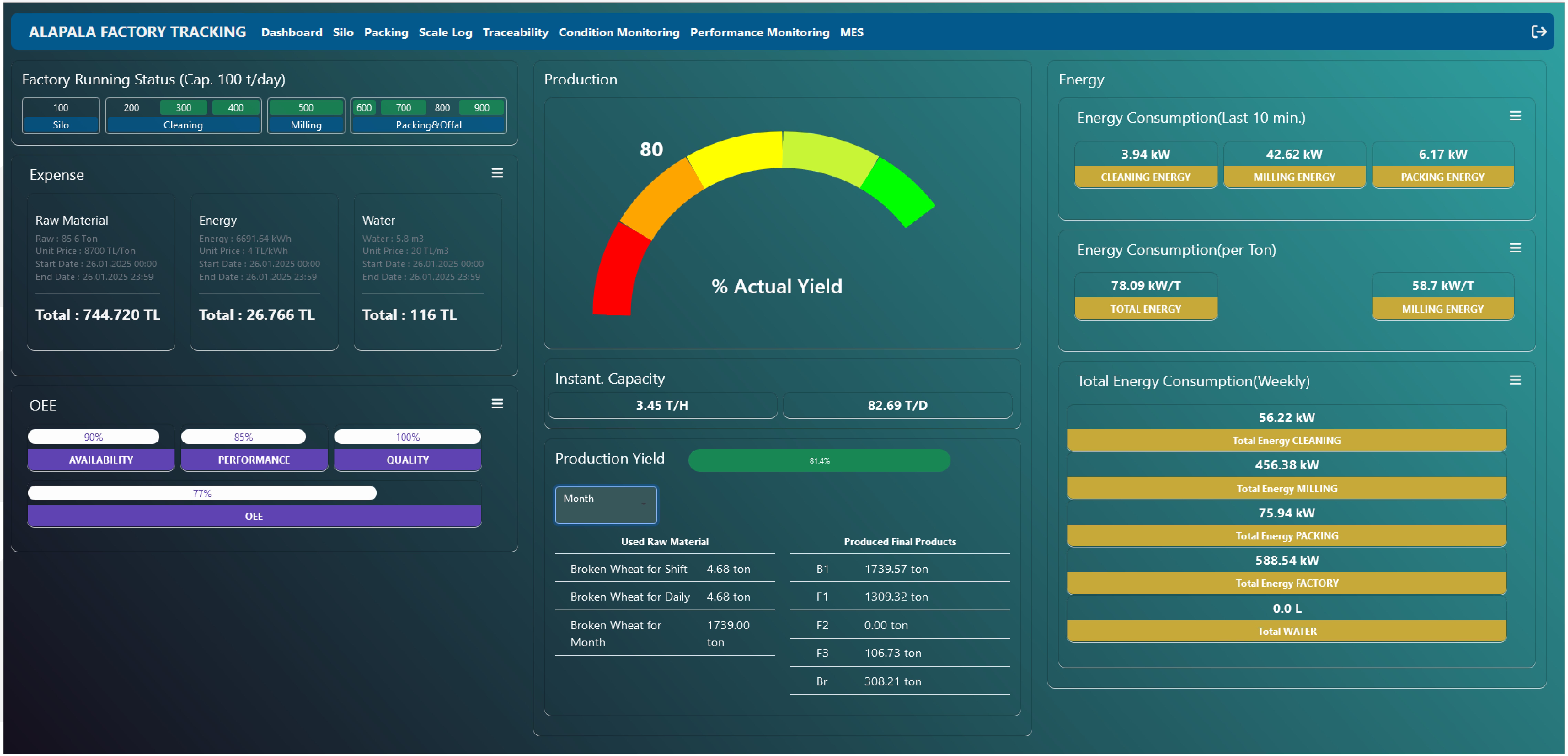
Digital Services

Alapala Plant Management System (APS)

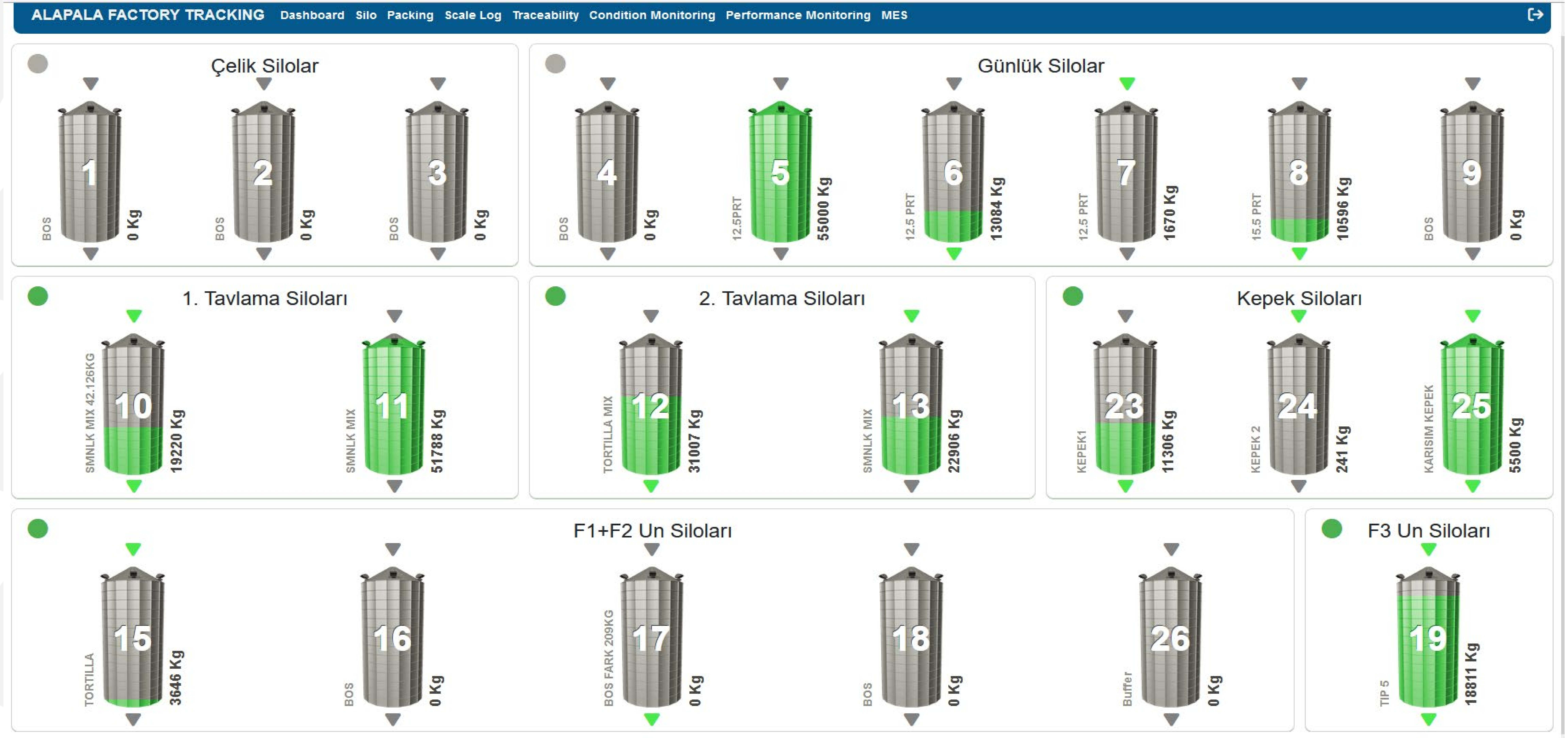
1/ MIS+ (Management Information System +) with SCADA

Silo Storage Management
Recipe Management
Yield Monitoring
Temperature and Vibration Monitoring
Energy Monitoring
OEE
Traceability

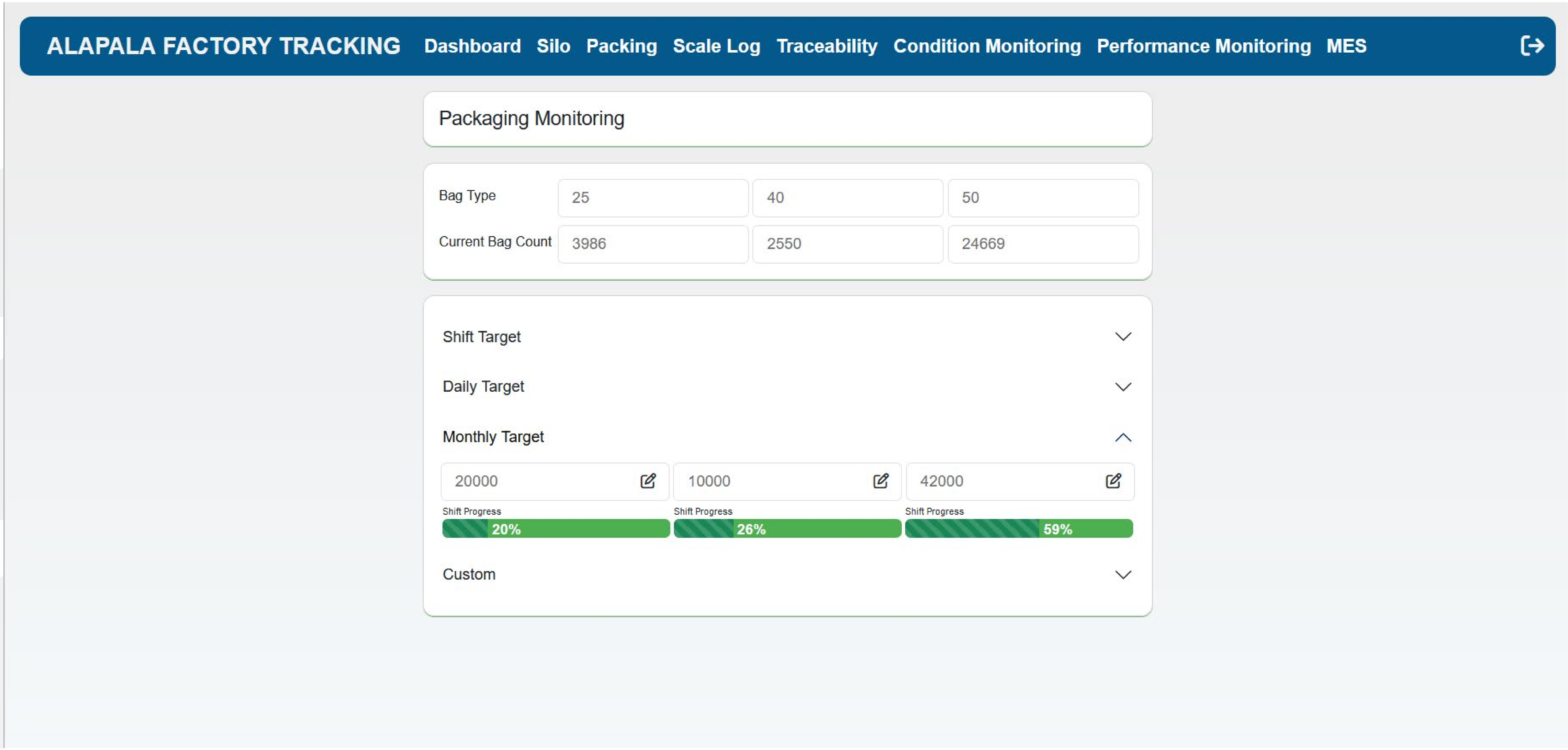
Digital Services /Dashboard



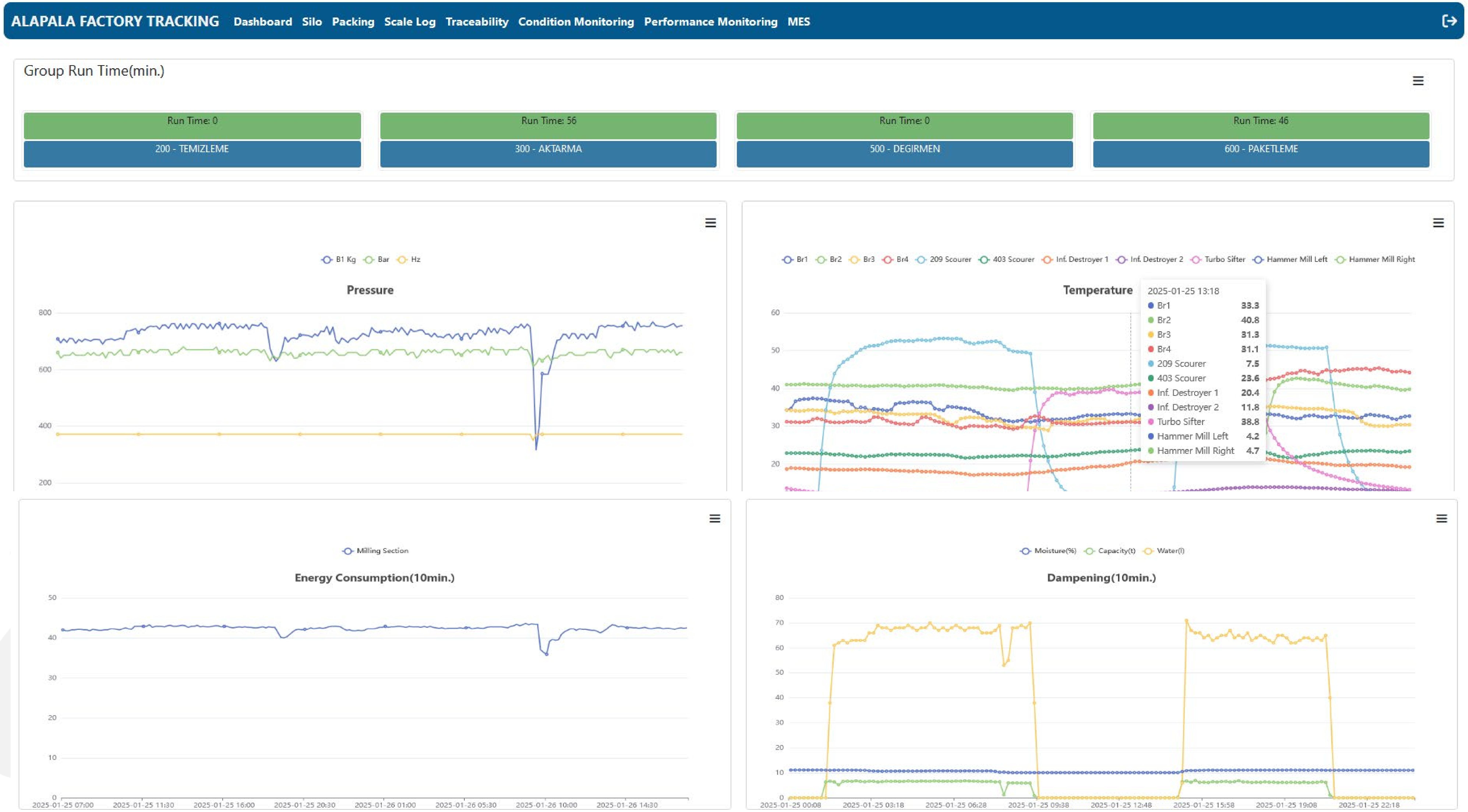
Digital Services /Silos



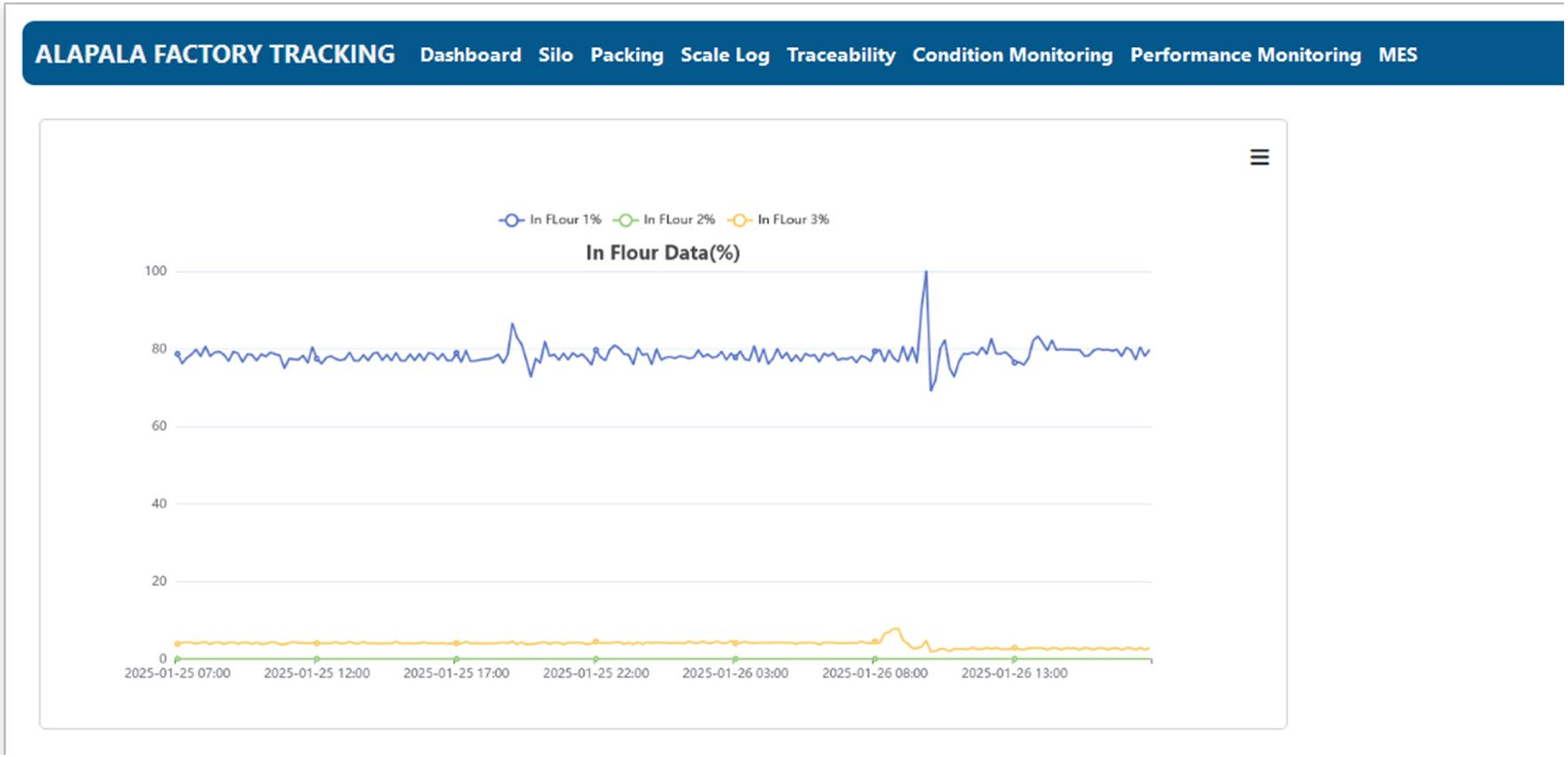
Digital Services/Packaging



Digital Services / Condition Monitoring



Digital Services /Performance Monitoring



Digital Services / Traceability

I4 Next Generation Milling

ALAPALA FACTORY TRACKING Dashboard Silo Packing Scale Log Traceability Condition Monitoring Performance Monitoring MES

25 entries per page Search: Excel

sira_no	date_time	device_name	device_type	quantity	from_silo_number	from_silo_name	from_silo_mamul	to_silo_number	to_silo_name	to_silo_mamul
1	2025-01-27 12:52:14	FB 10	Flow Balancer	1500	10	Silo 10	SMNLK MIX 42.126KG	13	Silo 13	SMNLK MIX
2	2025-01-27 12:52:14	Kepek Kantari	Kantar	63	0	Milling		24	Silo 24	KEPEK 2
3	2025-01-27 12:52:14	F3 Kantari	Kantar	45	0	Milling		19	Silo 19	TIP 5
4	2025-01-27 12:52:14	F1 Kantari	Kantar	240	0	Milling		16	Silo 16	BOS
5	2025-01-27 12:52:14	B1 Kantari	Kantar	352	12	Silo 12	TORTILLA MIX	0	Milling	
6	2025-01-27 12:52:02	Kepek Kantari	Kantar	63	0	Milling		24	Silo 24	KEPEK 2
7	2025-01-27 12:52:02	F3 Kantari	Kantar	45	0	Milling		19	Silo 19	TIP 5
8	2025-01-27 12:52:02	F1 Kantari	Kantar	241	0	Milling		16	Silo 16	BOS
9	2025-01-27 12:52:02	B1 Kantari	Kantar	356	12	Silo 12	TORTILLA MIX	0	Milling	
10	2025-01-27 12:42:15	FB 10	Flow Balancer	1466	10	Silo 10	SMNLK MIX 42.126KG	13	Silo 13	SMNLK MIX
11	2025-01-27 12:42:15	Kepek Kantari	Kantar	60	0	Milling		24	Silo 24	KEPEK 2
12	2025-01-27 12:42:15	F3 Kantari	Kantar	48	0	Milling		19	Silo 19	TIP 5
13	2025-01-27 12:42:15	F1 Kantari	Kantar	239	0	Milling		16	Silo 16	BOS
14	2025-01-27 12:42:15	B1 Kantari	Kantar	352	12	Silo 12	TORTILLA MIX	0	Milling	
15	2025-01-27 12:42:14	Kepek Kantari	Kantar	63	0	Milling		24	Silo 24	KEPEK 2
16	2025-01-27 12:42:14	F3 Kantari	Kantar	45	0	Milling		19	Silo 19	TIP 5
17	2025-01-27 12:42:14	F1 Kantari	Kantar	255	0	Milling		16	Silo 16	BOS
18	2025-01-27 12:42:14	B1 Kantari	Kantar	357	12	Silo 12	TORTILLA MIX	0	Milling	
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21	2025-01-27 12:32:13	F3 Kantari	Kantar	45	0	Milling		19	Silo 19	TIP 5
22	2025-01-27 12:32:13	F1 Kantari	Kantar	240	0	Milling		16	Silo 16	BOS
23	2025-01-27 12:32:13	B1 Kantari	Kantar	339	12	Silo 12	TORTILLA MIX	0	Milling	
24	2025-01-27 12:32:13	Kepek Kantari	Kantar	60	0	Milling		24	Silo 24	KEPEK 2

Digital Services / MES

I4 Next Generation Milling

ALAPALA FACTORY TRACKING Dashboard Silo Packing Scale Log Traceability Condition Monitoring Performance Monitoring MES

Production Orders Recipe Materials

All Production Order

New Production Order

10 entries per page

Search:

Excel

id	Ref Number	Recipe	Limit Type	Quantity	Production Date	Message	Status	action
13	POFB2CFC	RCP005	Limited	35000	22-01-2025	24.01 Tarihinde yükleme yapılacak.	Active	
14	PO769082	REC-MZ	Limited	100000	21-01-2025	GGG	Active	
10	OD4DD967	RCP005	Limited	20000	05-02-2025		Active	
12	O7CDE4DD	REC004	Limited	135000	20-01-2025	22.01 Tarihinde yükleme yapılacak.	Active	
2	O777C62E	RCP002	Limited	10000	29-01-2025	Önemli	Active	
1	O735E867	RCP002	Limited	10000	30-01-2025	Önemli	Active	
8	O69F4761	RCP005	Limitless	0	17-01-2025	msgh	Active	
11	O3DC2050	REC001	Limitless	0	05-02-2025		Active	

Digital Services

Alapala Plant Management System (APS)

2/ MMS (Maintenance Management System)

Planned/Unplanned maintenance (instructions, spare parts etc.)

Downtime Monitoring

Digital Services

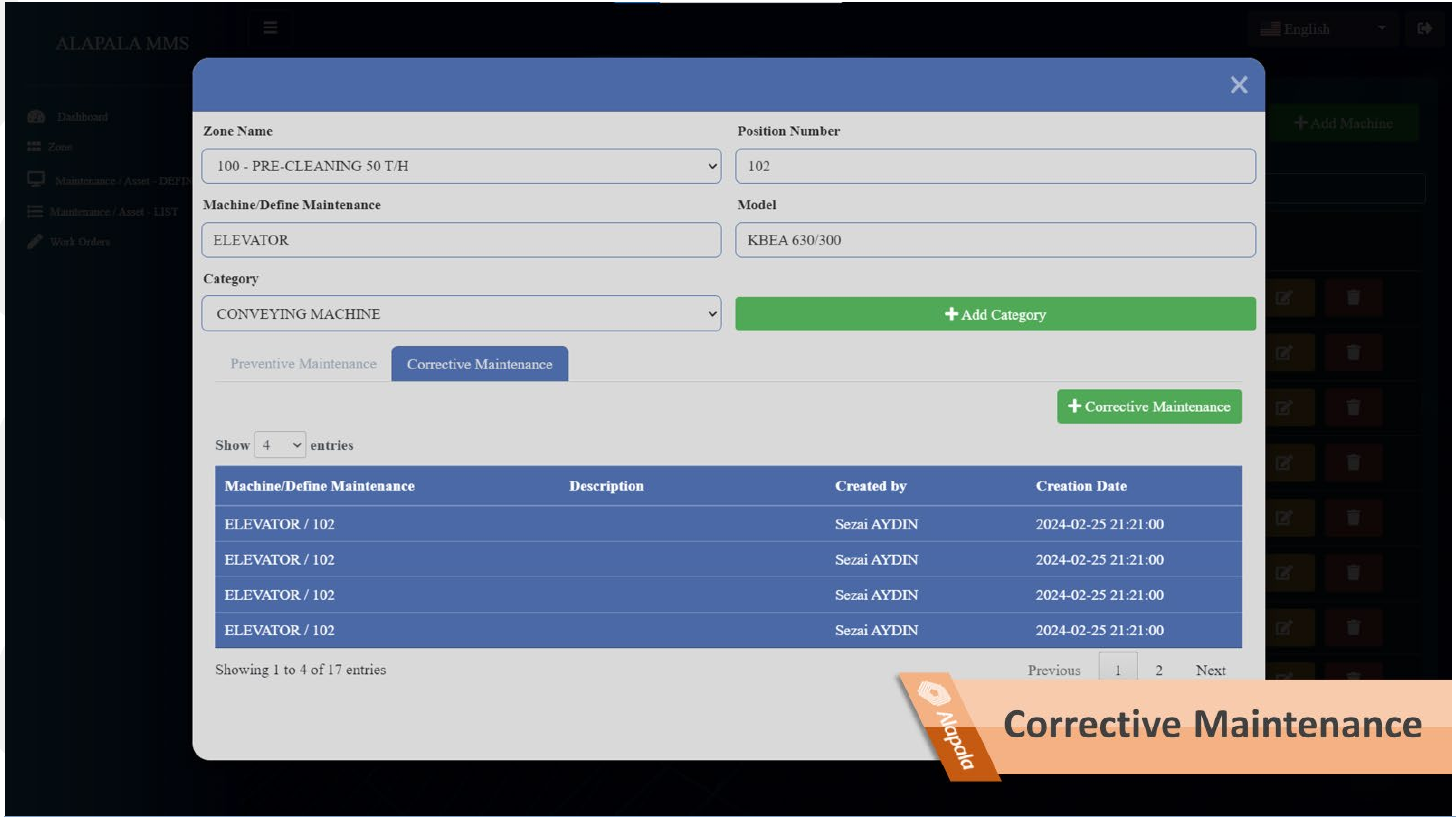
Digital Services

Alapala

Digital Services

Digital Services

Digital Services



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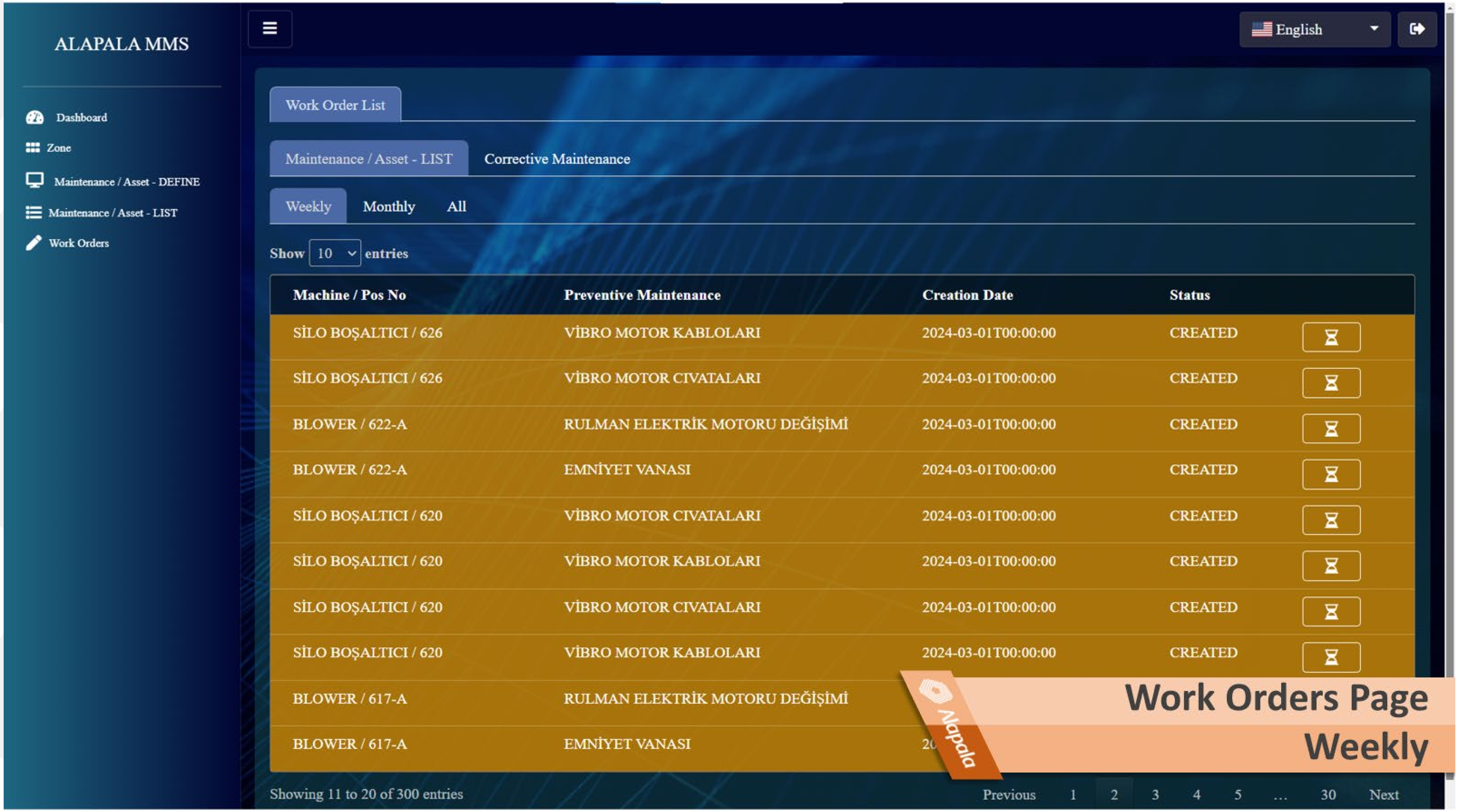
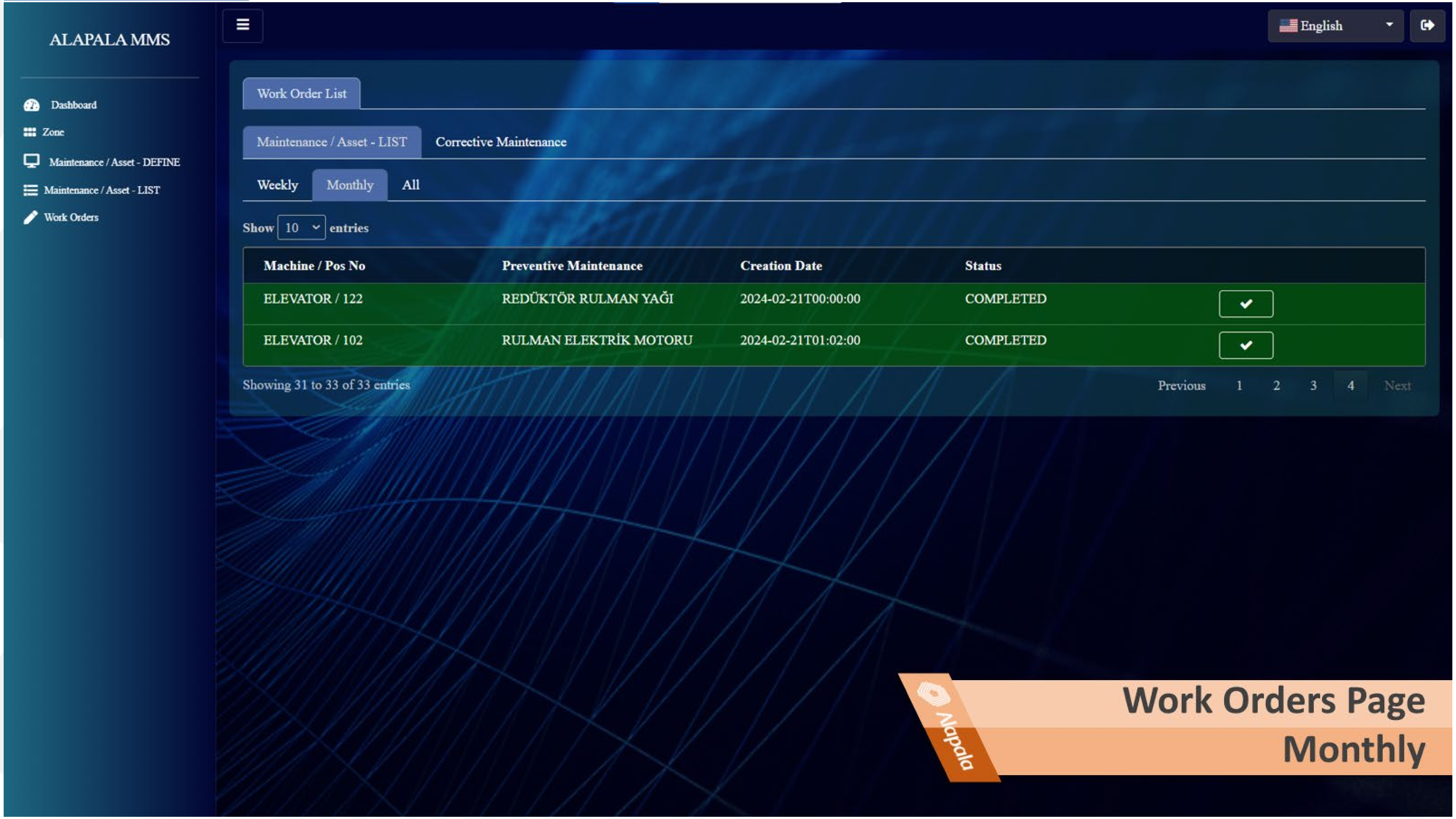
Digital Services



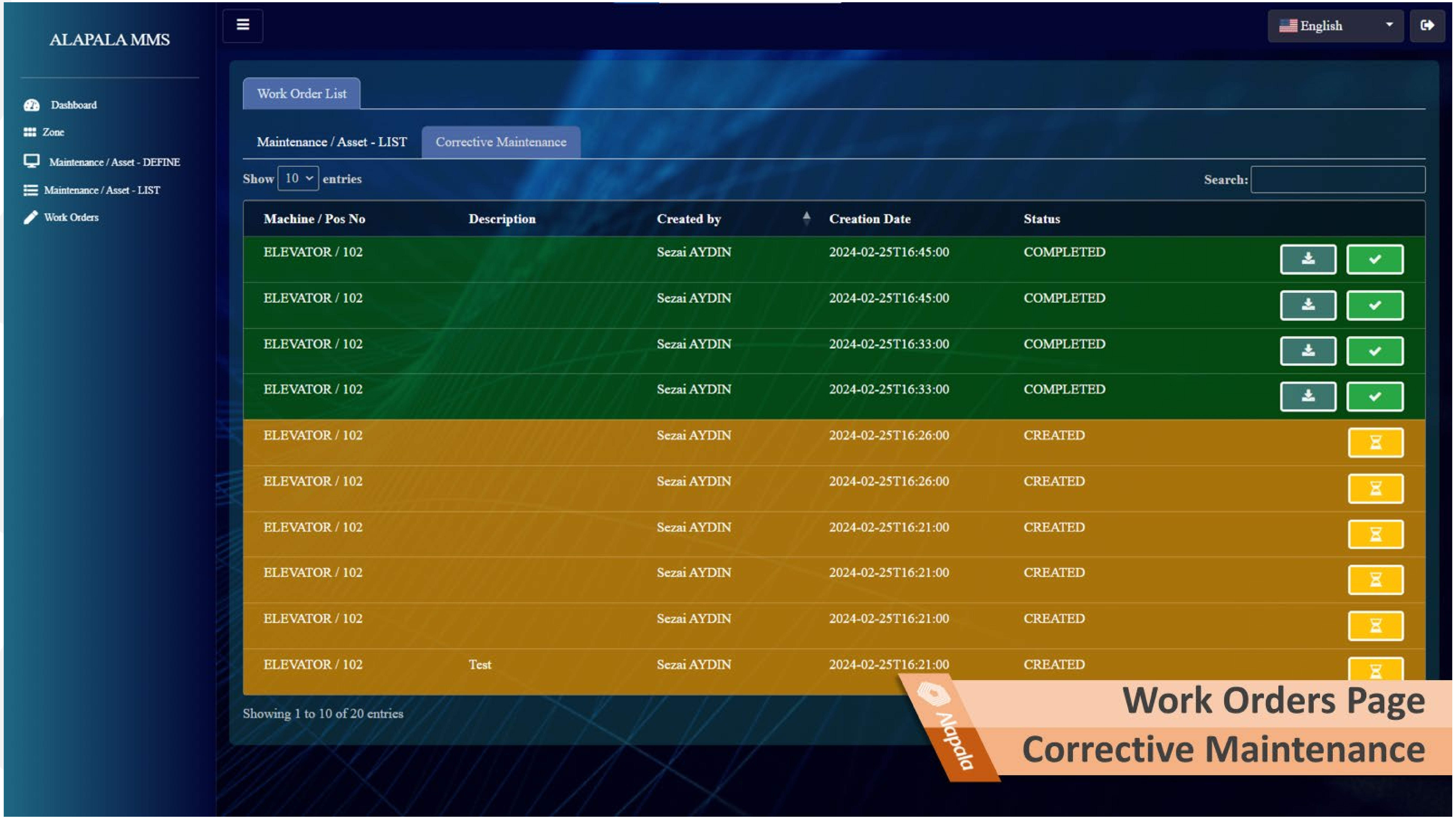
Work Orders Page
Weekly

Digital Services

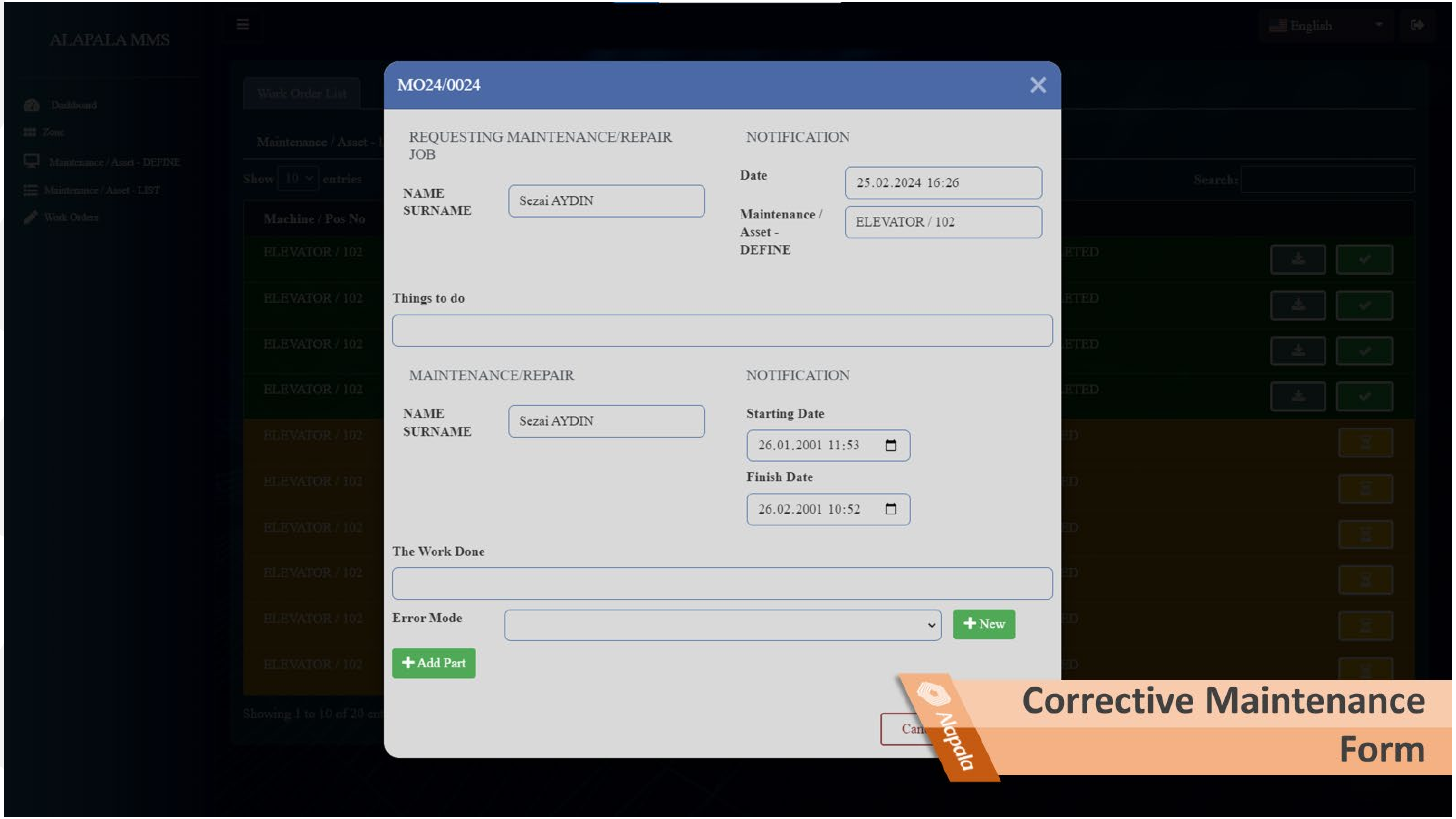


Alapala

Digital Services



Digital Services



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Conclusion

A Miller Can Not Be Replaced!

To conclude,
It is always important for us to know millers requirements to automate your milling facilities.

For this reason, we humbly request you to advice us of your requirements.

This will enable very important DATA for us to DESIGN the system as a tailor-made to Miller specific requests.

Thank You

Alapala

NEXT GENERATION

MILLING SYSTEMS

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