

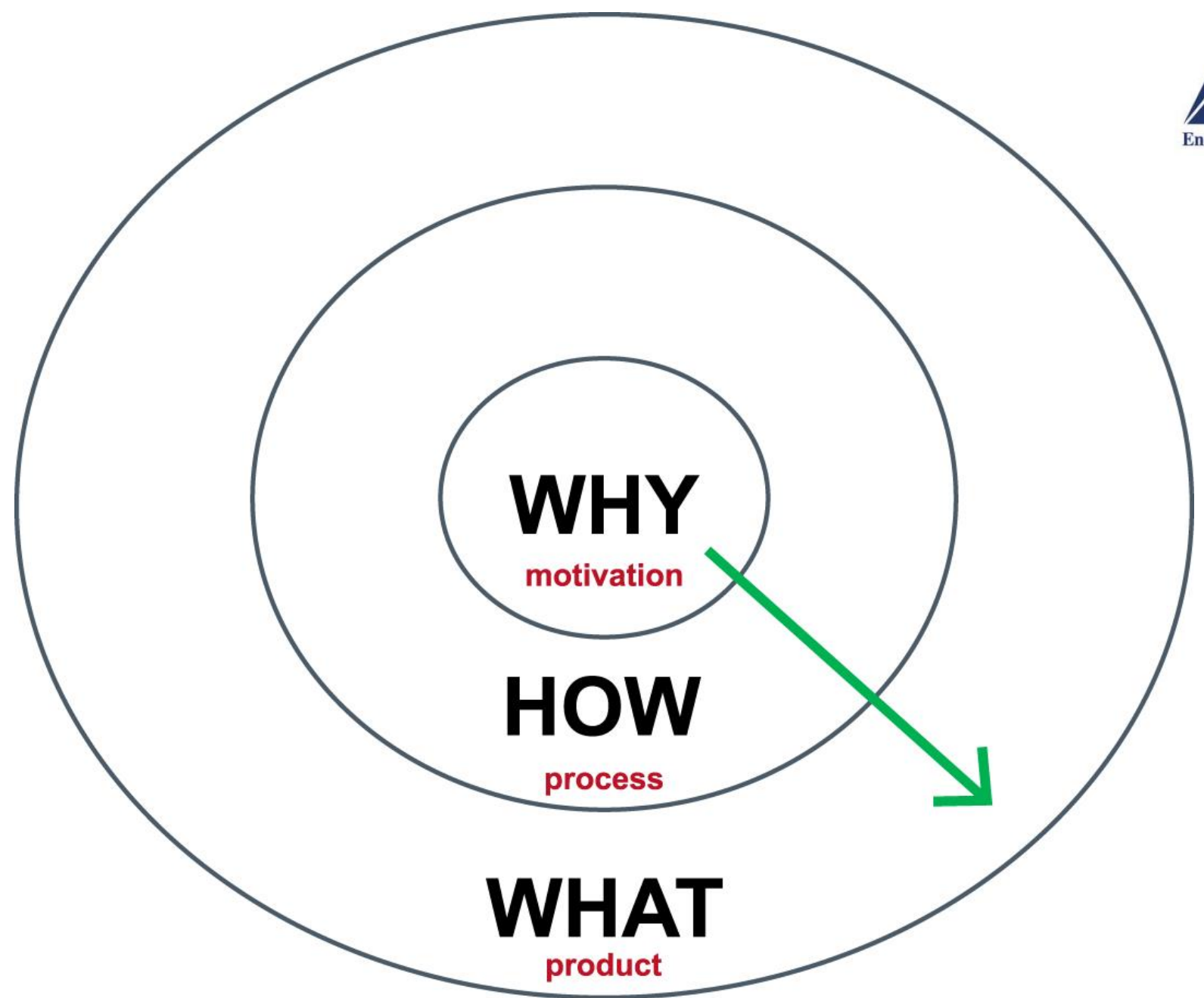
EMPOWER YOUR ANALYTICS WITH OPERATIONAL DATA
2019 OSISOFT MUMBAI SEMINAR

Achieving Operational Excellence with PI system

M. Sravani, ITC Limited
Amit Kothari, ITC Limited

14th October, 2019

The Golden Circle



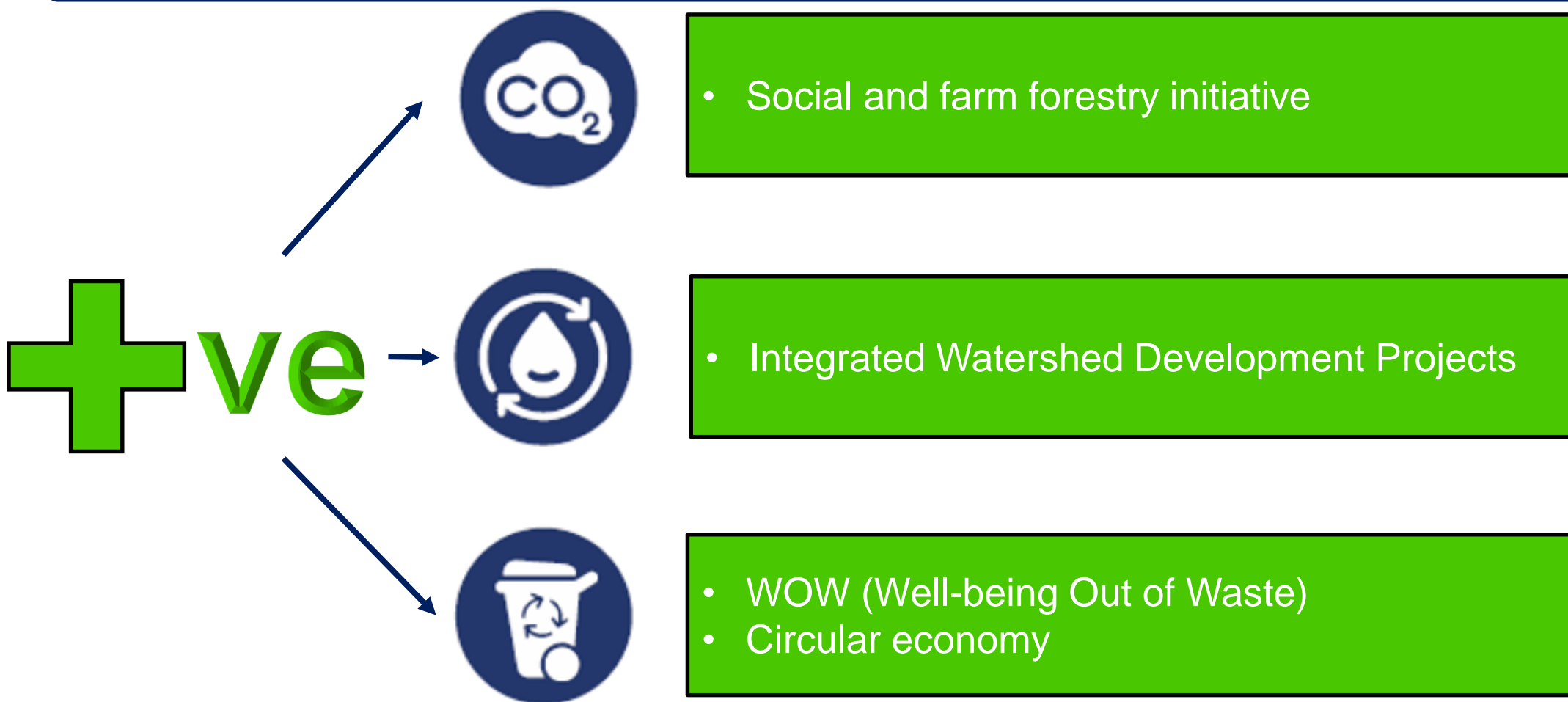
Who are we?



**Figures as of March, 2019*

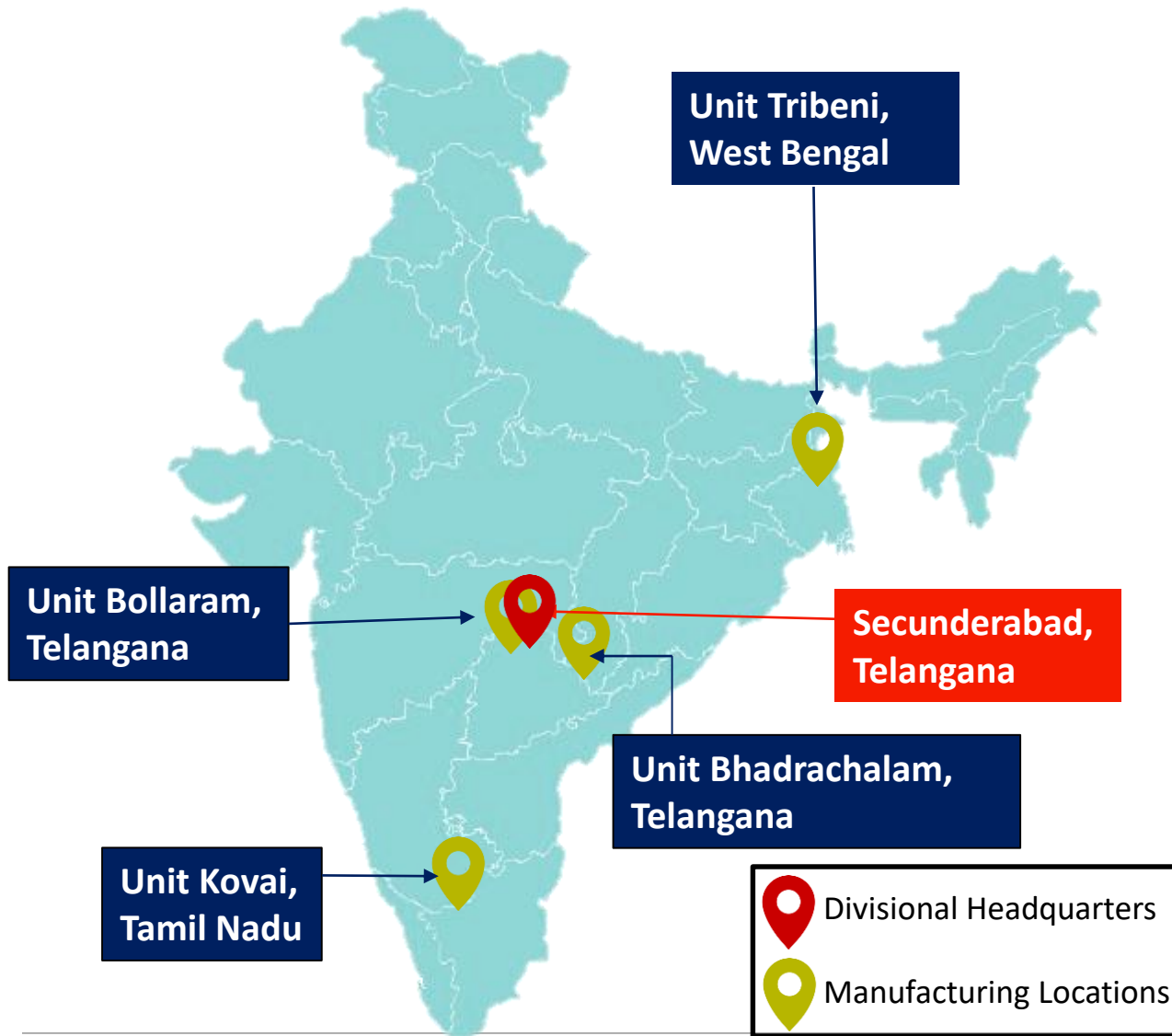
Triple bottom line (Environment)

Only company in the world to be Water +ve, Carbon +ve and Solid Waste Recycling +ve for 12+ years



**Figures as of March, 2019*

PSPD at a glance



4 World class manufacturing Units

India's first ECF bleaching line

In-house ClO_2 and Ozone plant

Asia's first in-house Mechanical Pulp plant

Forest Stewardship Council (FSC) certified units

- Environmentally appropriate
- Socially beneficial



**ECF: Elemental Chlorine Free*

Premium End User Engagement



Business Verticals



Paperboards

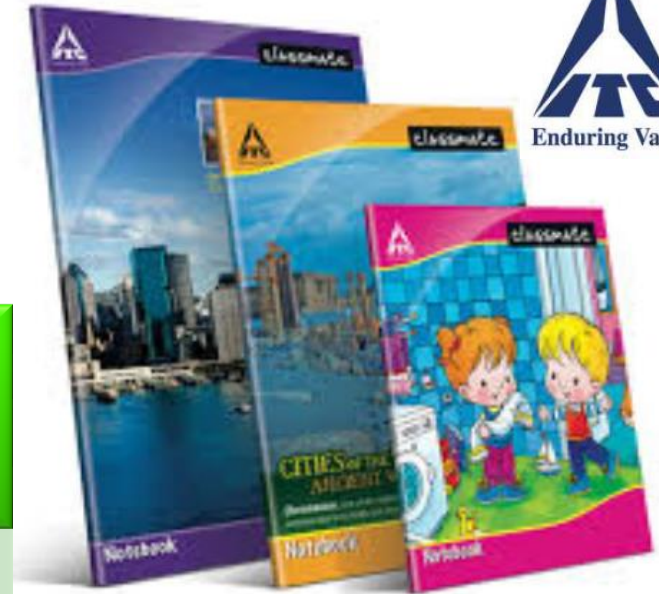
- FMCG
- Pharma
- Cigarettes
- Foods
- Liquor
- Liquid Packaging
- Paper Cups
- Apparels
- Note Books

Writing & Printing Papers

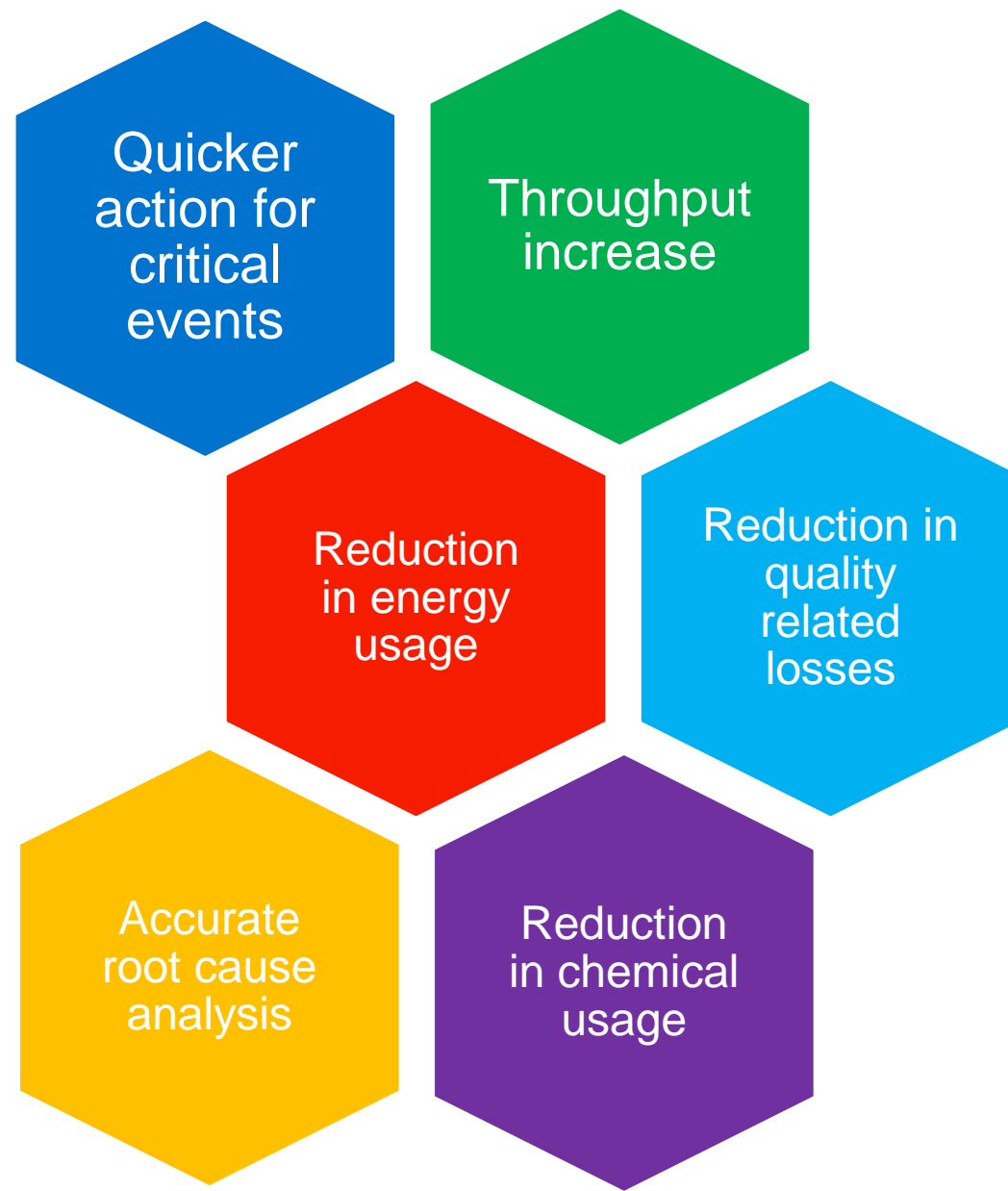
- Note Books & Stationery
- Diaries
- Calendars
- Printed Books
- Commercial Printing

Specialty Papers

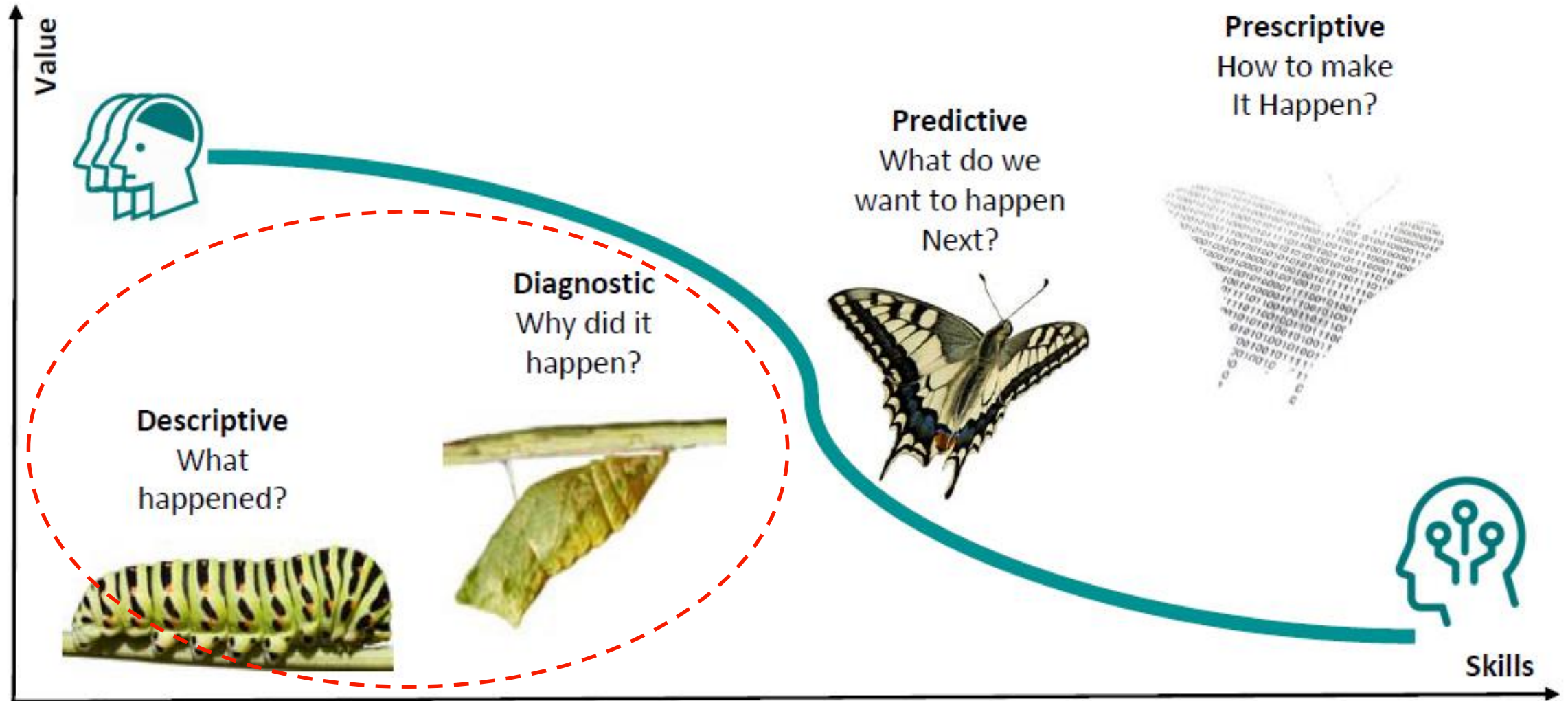
- Cigarettes
- Decorative Laminates
- Bible Printing
- Pharma



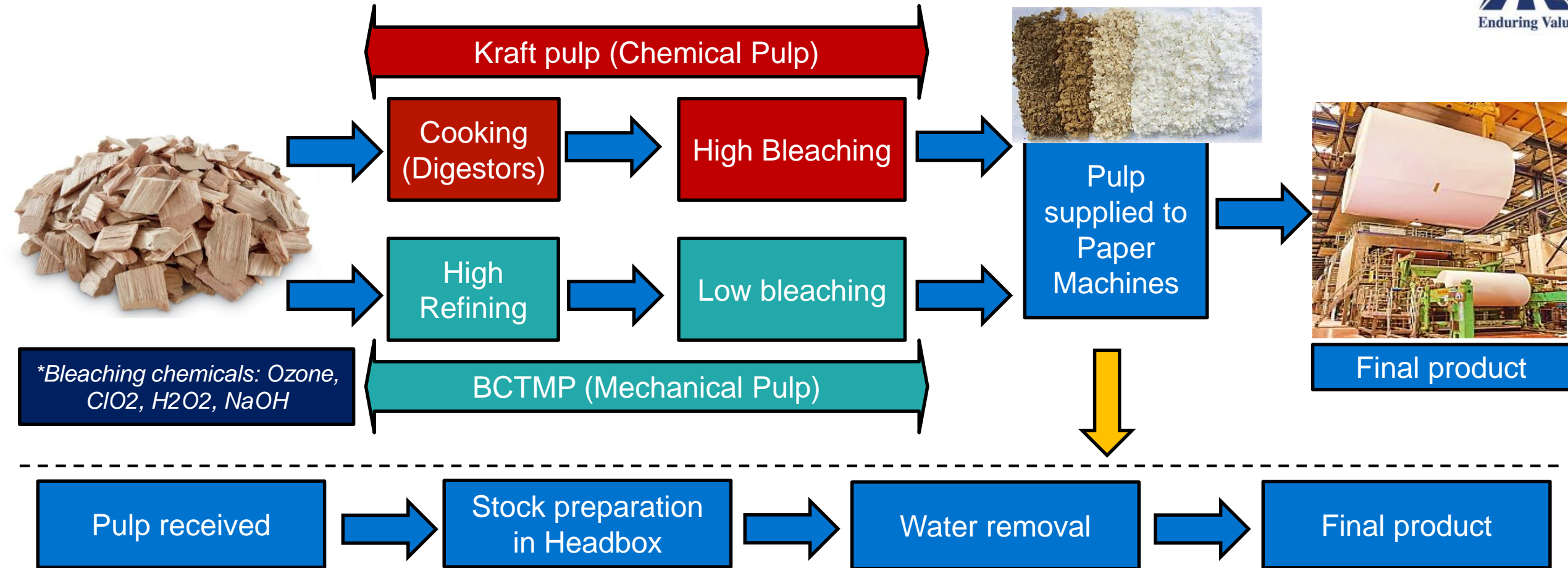
Our targets



Data usage maturity



INTEGRATED PULP AND PAPER PROCESSES



*** This is an extremely simplified view of the process. Every highlighted step has many nuances and lot of sub-steps including addition of chemicals at multiple locations in different amounts**

Data sources for advanced analytics projects

DCS data

- 5.5 months
- 740 tags¹
- 5/9 sec frequency



DCS: Distributed Control System

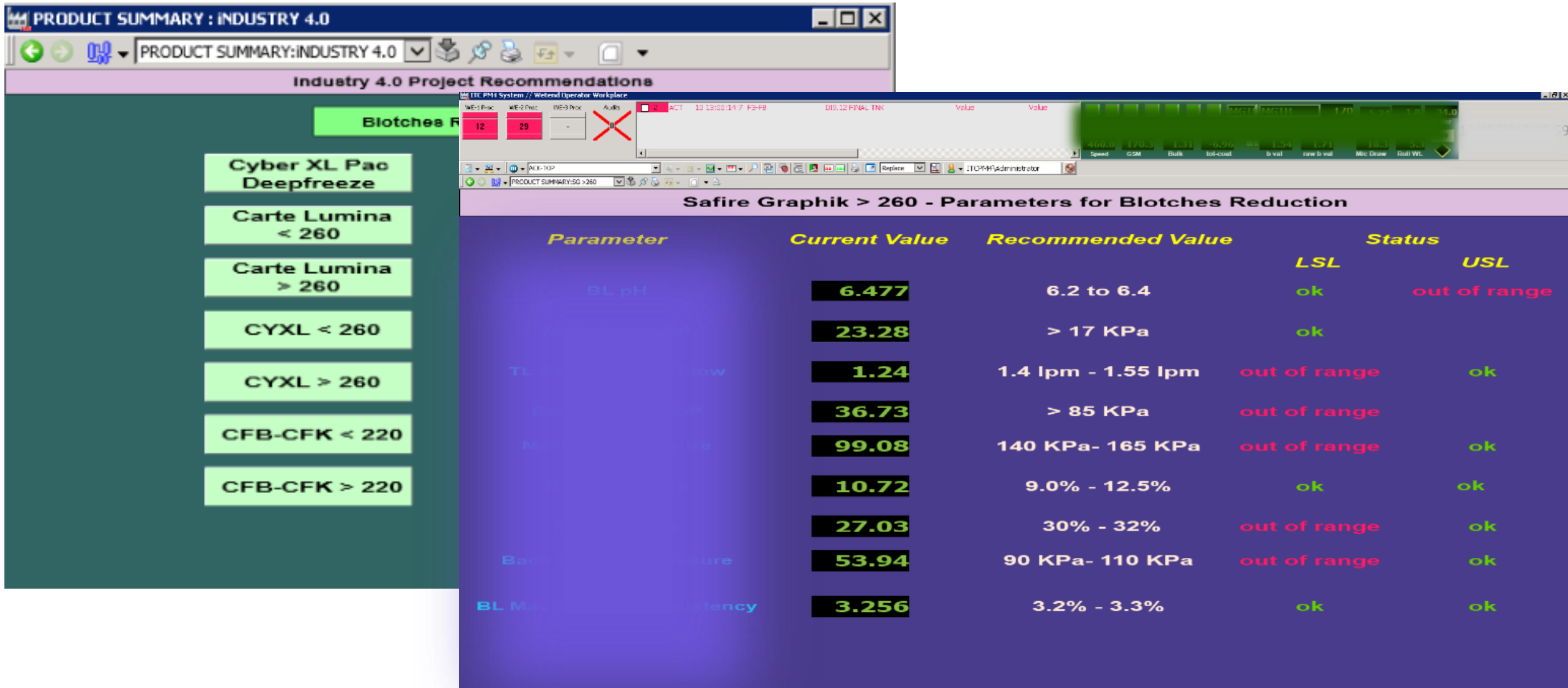
NCP: Non Conformance Product

Parsytec: Paper board inspection system.

Optivision: MES (Manufacturing Execution System)

Q/SD: Quality Information Service Department

Golden batch dash boards in DCS



Challenges encountered

- Non-availability of enough historical data
- Disparate and multiple data sources
- Lack of data accessibility to individuals
- Time spent on stitching the data

Proof of Concept (PoC): Aug'18



PoC on PM #4

Scope

- DCS and QCS
- MES

Objectives

- Collection and archival of data
- Centerlining of data to be demonstrated

Success metrics

- Ease of integration of data sources
- End user experience of the software
- Demonstration of benefit for a quality related loss reduction case

Asset Framework

\\PSPBCOSIPISER\pspdmes - PI System Explorer

File Search View Go Tools Help

Database Query Date Check In Refresh New Element New Attribute Search Elements

Elements

- Elements
 - ITC-PSPD
 - BCM
 - PM4
 - CCK
 - CLD_PIOPTI_Master_Data
 - Dry-End
 - OPTI
 - OPTI_Current
 - OPTI_DATA
 - PULP MIL
 - SFT
 - TMP
 - Wet-End
 - AUXILIARY
 - CCK
 - EXTERNAL(CHEM)
 - FORMING SECTION
 - FRBT
 - MACHINE
 - MACHINE CHEST
 - MIXING CHEST
 - NA
 - PRESS PART
 - PUL
 - PULP MILL
 - QCS DATA
 - REFINED CHEST
 - SFT
 - SHORT CIRCULATION
 - UNREFINED CHEST

Element Searches

Element Attribute Search Results 1

Elements

Event Frames

Library

Unit of Measure

Contacts

Management

MACHINE CHEST

General Child Elements Attributes Ports Analyses Notification Rules Version

Filter

Name	Value
BL DYE1 DOSING (KG/T)	0
BL DYE1 DOSING FLOW	-0.0675
BL DYE1 DOSING SP	0
BL DYE2 DOSING ACTUAL (KG/T)	-0.0057858
BL DYE2 DOSING FLOW	-0.045
BL M/C CHST CY%	3.3 %
BL M/C CHST LVL	78.031 %
BL M/C CHST LVL SP	78 %
BL MACHINE CHEST PUMP LOAD	13.405 A
BL MACHINE CHEST PUMP RPM	1042.5 rpm
BL OBA DOSING FLOW	-0.032812
BL OBA DOSING SP	0
BL PULP BASIS WEIGHT SP	23.542 L/s
BL PULP STOCK FLOW	0.43594 L/s
BL PULP STOCK FLOW MW	23.869 L/s
BL ROSIN/WAX	2.9 L/s
BL STOCK SHUT OFF OUTPUT	100 %
BPM4_FR-0629-ACT:R_VAL_Range	10
BPM4_FR-0623-ACT:R_VAL_Range	10
BPM4_FR-0623:VALUE	No Data
BPM4_FR-0623:VALUE_Color	No Data
BPM4_FR-0609-ACT:R_VAL_Range	10
BPM4_FR-0607:VALUE	No Data

Group by: ☐ Category ☐ Template

Name: BL DYE1 DOSING (KG/T)

Description:

Properties: <None>

Categories:

Default UOM: <None>

Value Type: Single

Value: 0

Display Digits: -5

Data Reference: PI Point

Settings...

\\PSPBCOSIPISER\BPM4_FR-0624:VALUE

Limits Forecasts

MACHINE CHEST Modified:11/4/2018 11:01:17 PM Owner:PSPBCOSIPISER\Prevelege Version: 1/1/1970 12:00:00 AM, Revision 93

Centrelines Dashboard



Centrelines Dashboard - PM 4

SG 300

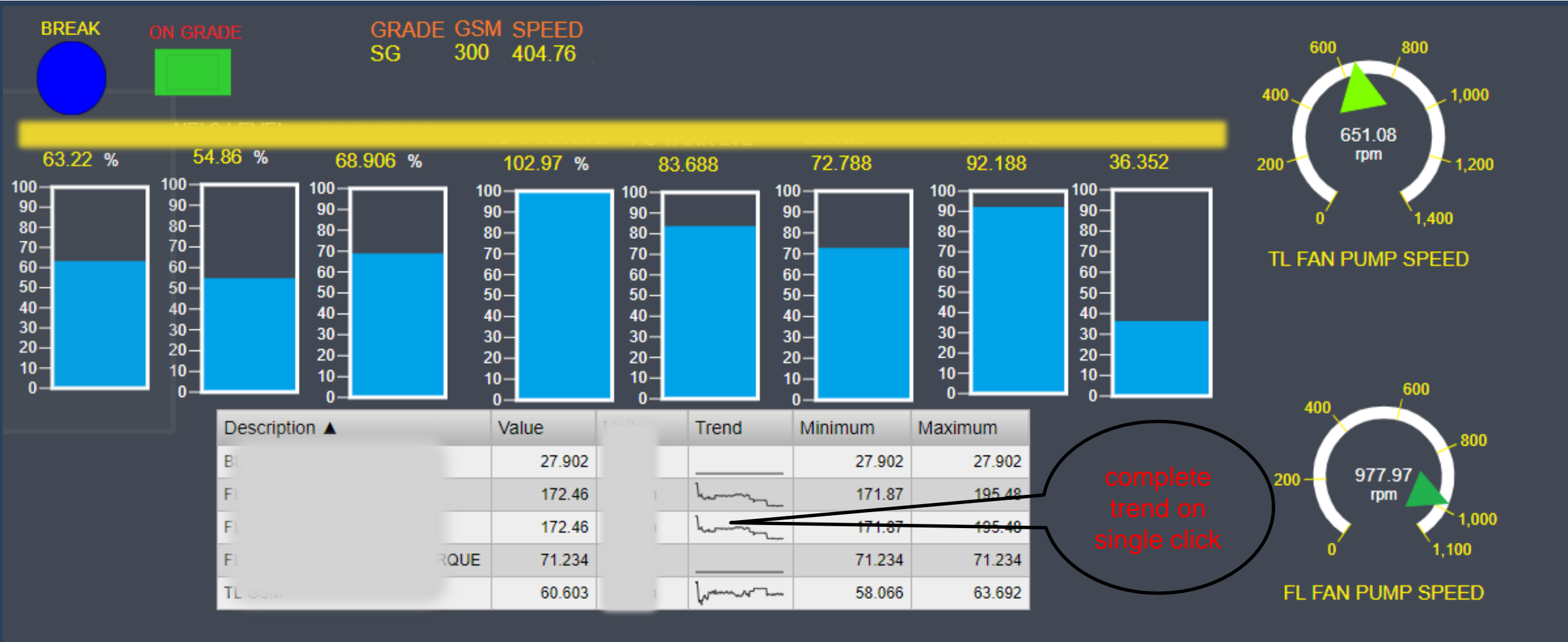
Wet End Parameters

Dry End



Jumbo ID	PM8Y041050	Family	GSM	Parameter	ALPHA	BLISTER	BULK	B VALUE	CALIPER	GLOSS	MOISTURE	PLYBOND	PPS	STIFFNESS CD	STIFFNESS MD	SUBSTANCE	TSL_MD_AVG	TSL_CD_AVG	TSO STD
Start Time	2018-11-11 04:11:35	SAFG	290	Std.	0.00	1.00	1.20	-7.20	360.00	40.00	7.00	150.00	2.30	0.00	0.00	300.00	0.00	0.00	0.00
End Time	2018-11-11 04:45:38			Actual	No Data	No Data	No Data	-7.38	359.07	39.79	7.00	251.00	1.08	No Data	No Data	289.00	No Data	No Data	No Data










Sample dashboard created by an end user

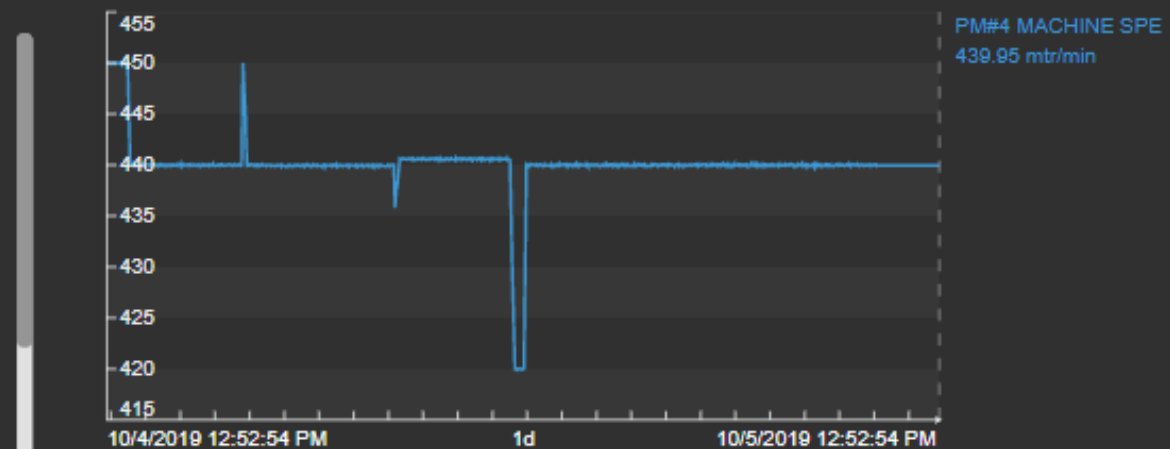









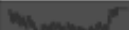


Dashboard by Instrumentation engineers



Dashboard by Mechanical engineers

Description ▼		Value	Units	Trend	Minimum	Maximum
SE	TOF	62.245	%		56.903	72.432
SL	SPE	445.43	MPM		425.89	457.25
RE		59.394	%		0.16047	78.815
MO		16.927	%		5.9359	18.283
MO		13.759	%		10.537	14.848
MO	I/O Timeout		NPM		No Data	No Data
CO	AD	60.594	A		60.406	64.844
CO	AD	60.594	A		60.406	64.844
9th		20.591	%		-3.0594	142.32
3R	IE	2.3719	%		-75.973	44.824



Description		Value	Units	Trend	Minimum	Maximum ▲
		7.4802	%		5.9415	9.2622
		26.25	%		25.246	27.976
		26.25	%		25.246	27.976
		26.418	%		25.368	28.162
		32.588	%		31.661	34.758
		40.763	%		39.975	43.606
		50.836	%		46.77	52.522
		56.514	%		53.47	56.601
		56.473	%		51.974	58.435
		60.406	%		57.139	60.406



Dashboard by Electrical engineers

WEB BREAK REEL DRUM SPEED GRADE GSM BREAK AT POPE REEL



453.22 MPM

CYB

225



SPECIFIC POWER FOR REFINERS

TL

106.31 kW

BL

295.33 kW

FL

0.28125 kW

BROKE

4.3397 kW

REFINER RUN FB & OVERLOAD ALARM

TL/BL 001



FL 10



TL 02



FL 11



TL 03



Broke 14



TL 04



FL trim 22



TL 05



BL 21



TL 06



Jumbo report

Jumbo Report						
Jumbo:	PM8W042534					
Start Time:	2018-09-25 19:38:11	End Time:	2018-09-25 20:19:59			
Family:	CYXL	GSM:	270			
Tag:	GOLDEN					
Tags	Tag Description	Target Value	Mean	Std. Deviation	Min	Max
BPM4_FR-0603:VALUE	TL DYE2 DOSING(KG/T)	0.10	0.04	0.00	0.04	0.04
BPM4_FR-0607:VALUE	TL	0.57	0.94	0.05	0.89	1.02
BPM4_FR-0623:VALUE	BL	0.00	0.07	0.00	0.07	0.07
BPM4_PHIC-0611:WSP	TL	5.04	5.90	0.00	5.90	5.90
BPM4_PHIC-0631:WSP	BL	5.07	6.01	0.00	6.01	6.01
BPM4_PHIC-0650:WSP	FL	5.26	6.00	0.00	6.00	6.00
BPM4_FR-0606:VALUE	TL DYE2 DOSING(KG/T)	3.80	2.37	0.02	2.34	2.41
BPM4_FR-0608:VALUE	TL	3.80	1.03	0.03	0.98	1.08
BPM4_FR-0610:VALUE	TL	1.90	4.01	0.10	3.77	4.14
BPM4_FR-0626:VALUE	BL	6.65	3.39	0.03	3.34	3.45
BPM4_FR-0628:VALUE	BL	1.90	0.81	0.02	0.77	0.85
BPM4_FR-0630:VALUE	BL	1.90	3.08	0.01	3.05	3.11
BPM4_FR-0644:VALUE	FL ROSIN DOSING(KG/T)	4.75	2.51	0.02	2.47	2.55

Analysis of deviation of parameters between jumbos

Updating Golden batch parameters target values

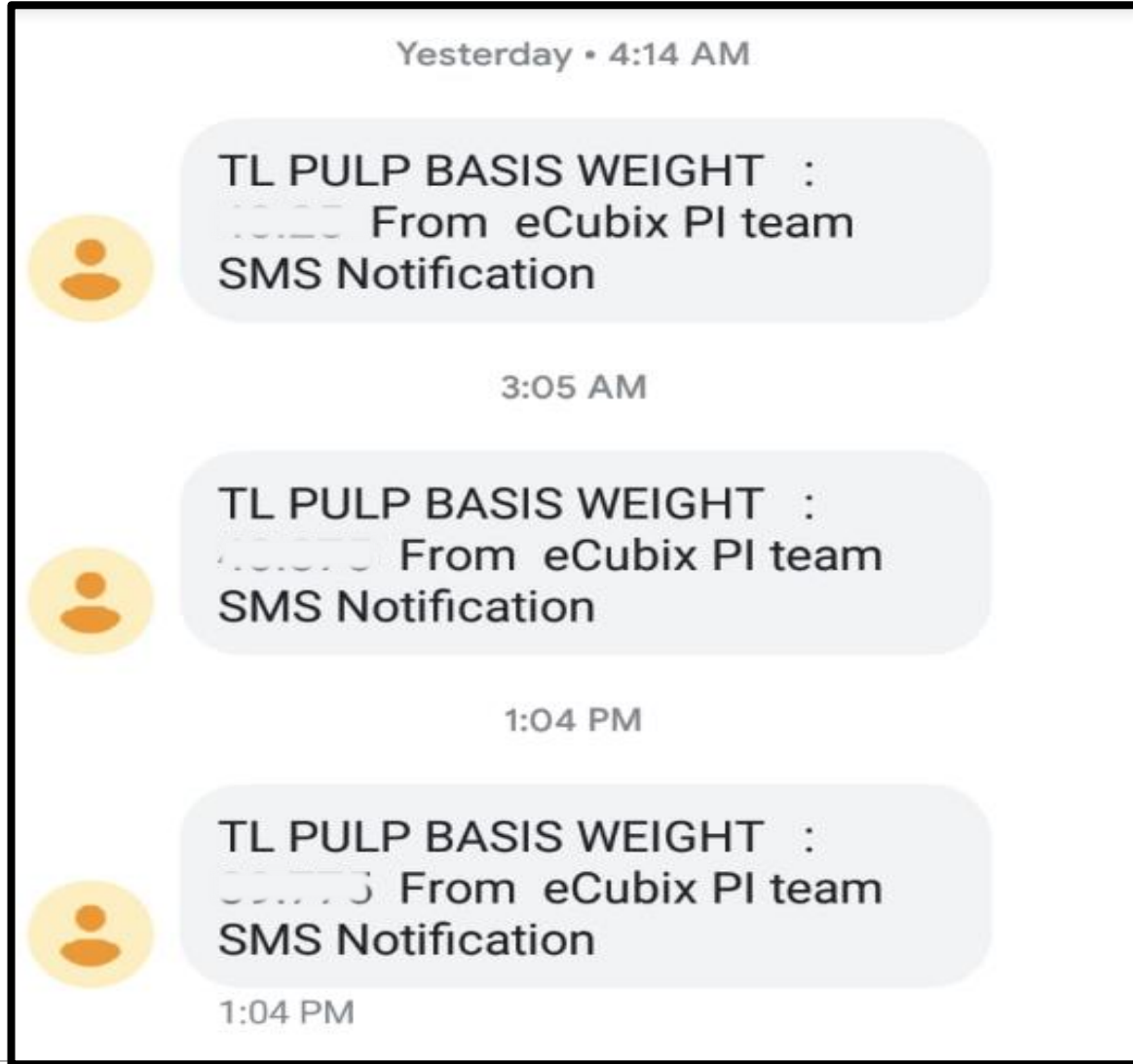
Run time report

RUN TIME REPORT						
From:	05/10/2019	To:	06/10/2019	Frequency:	15m	
Time	BPM4_FR-0603:VALUE	BPM4_FR-0607:VALUE	BPM4_FR-0623:VALUE	BPM4_PHIC-0611:WSP	BPM4_PHIC-0631:WSP	BPM4_PHIC-0650:WSP
05-Oct-19 00:00:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 00:15:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 00:30:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 00:45:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 01:00:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 01:15:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 01:30:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 01:45:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 02:00:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 02:15:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 02:30:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 02:45:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 03:00:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114
05-Oct-19 03:15:00	0.109999999	0	0.135000005	5.550000191	5.840000153	5.880000114

To have a focussed analysis of parameters between any time period

Back-tracking of quality complaints

Alerts and notifications



Real time visibility of situation on the machine floor

Quicker action in case of a critical event

Reduction in Losses due to Plybond

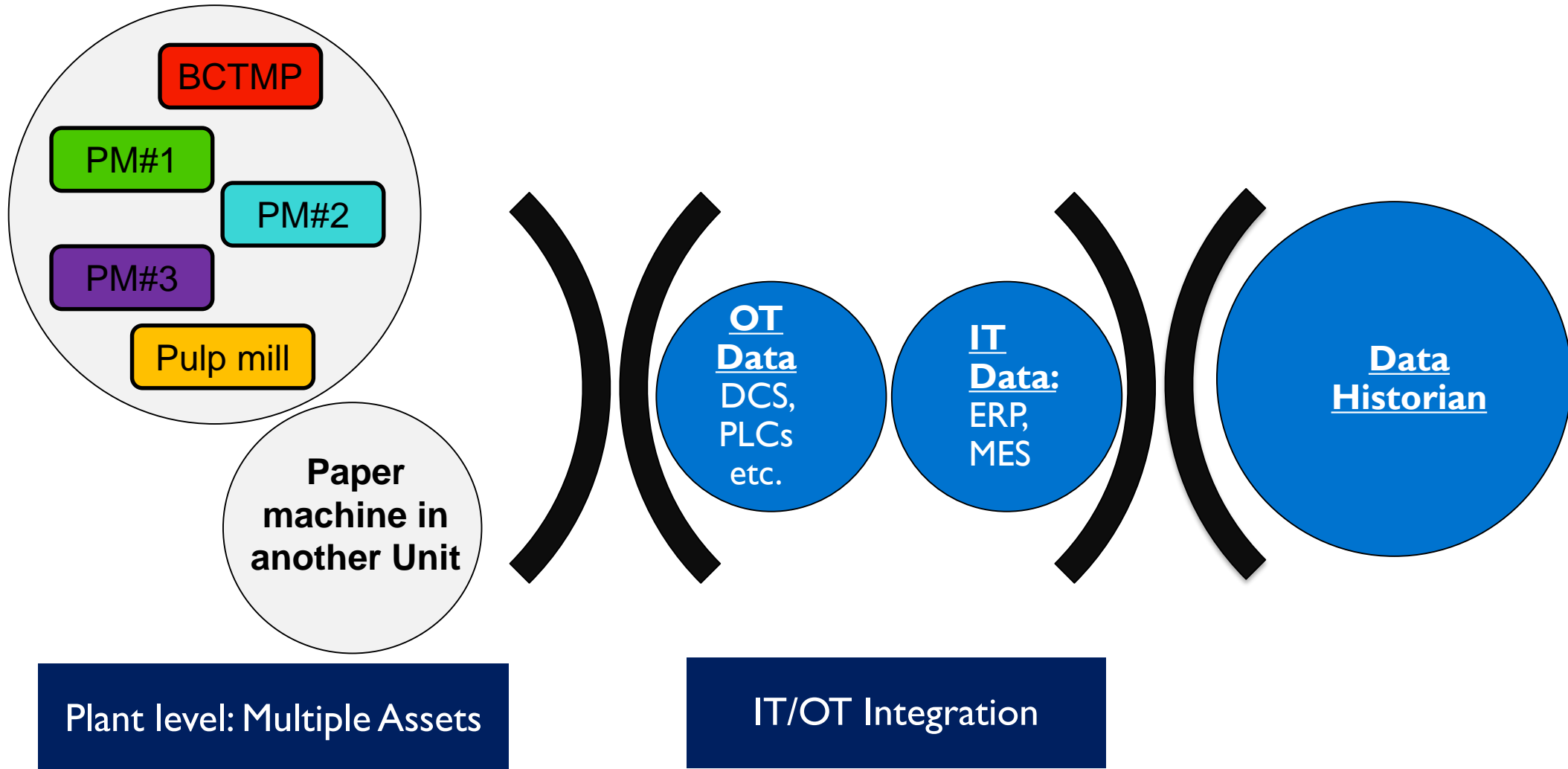


Way ahead: Project “Insight”



Project INSIGHT

Unit Bhadrachalam



Key takeaways

- From Descriptive and Diagnostic to Predictive and Prescriptive, it's a journey
- Single source of truth

Thank You

PI System is an unending source:

The more one uses it, the more benefits
one can extract out of it!

THANK YOU

OSIsoft®

謝謝 KEA LEBONA
TAPADH LEIBH 고맙습니다
БАЯРЛАЛАА MISAOTRA ANAO
DZIĘKUJĘ CI NGIYABONGA
TEŞEKKÜR EDERIM
DANKIE TERIMA KASIH
СПАСИБО
РАКМЕТ СИЗГЕ
GO RAIBH MAITH AGAT
БЛАГОДАРЯ GRACIAS
ТИ БЛАГОДАРАМ
TAK DANKE
РАҲМАТ
HATUR NUHUN
CẢM ƠN BẠN
WAZVIITA
GRACIES
DANKON TANK TAPADH LEAT
SHUKRA
SALAMAT
MULŢUMESC
FAAFETA
ESKERRIK ASKO
HVALA ХВАЛА ВАМ
TEŞEKKÜR EDERIM
GRAZIE
DI OU MÈSI
ĐAKUJEM
MATUR NUWUN
DANK JE
ΕΥΧΑΡΙΣΤΩ GRATIAS TIBI
AČIŮ SALAMAT MAHALO IĀ 'OE TAKK SKAL DU HA
GRAZZI PAKKA PÉR
PAXMAT CAĞA
FALEMINDERIT
SIPAS JI WERE TERIMA KASIH
UA TSAUG RAU KOJ
ТИ БЛАГОДАРАМ
СИПОС