



***Industry 4.0: SAP MANUFACTURING
EXECUTION per la digitalizzazione dei
processi di final assembly***

calpeda[®]

water passion

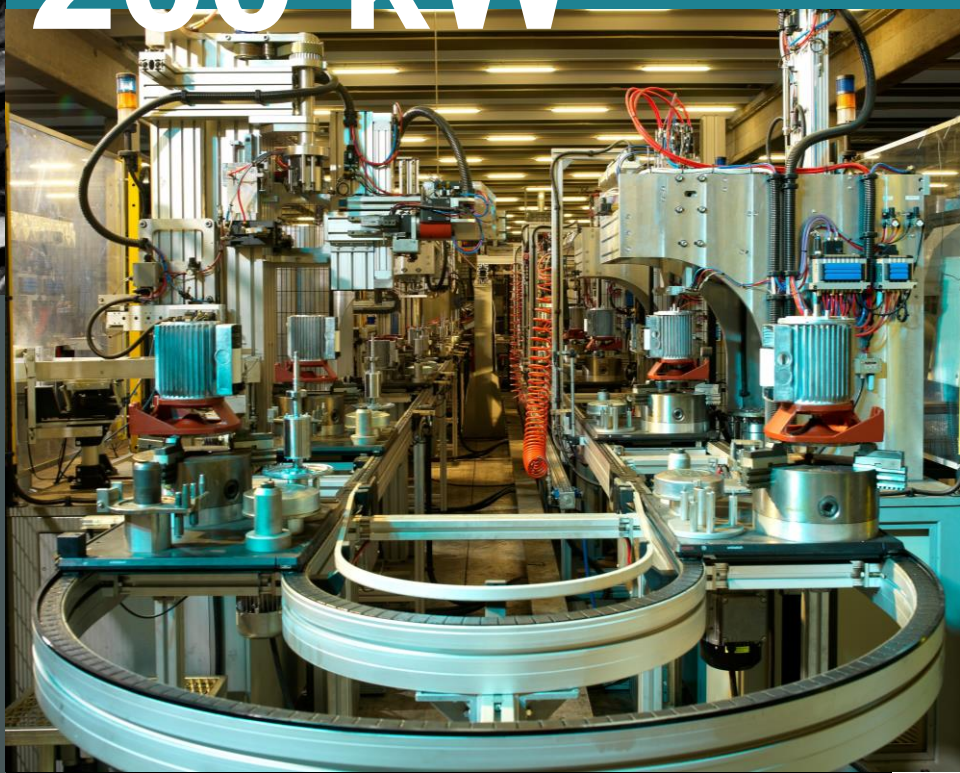


Calpeda è specializzata nella **ricerca**, nello **sviluppo** e nell'**industrializzazione** di sistemi di pompaggio



2000 tipi di
pompe
da 0,5 a
200 kW

57 anni
di storia



GAMME DI PRODOTTI



CENTRIFUGHE



MULTI-STADIO



AUTOADESCANTI



PISCINA



PERIFERICHE



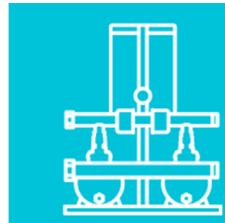
SOMMERSIBILI



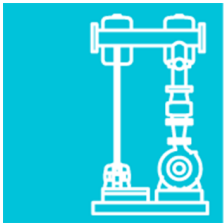
SOMMERSE



CIRCOLAZIONE



GRUPPI
DI PRESSIONE



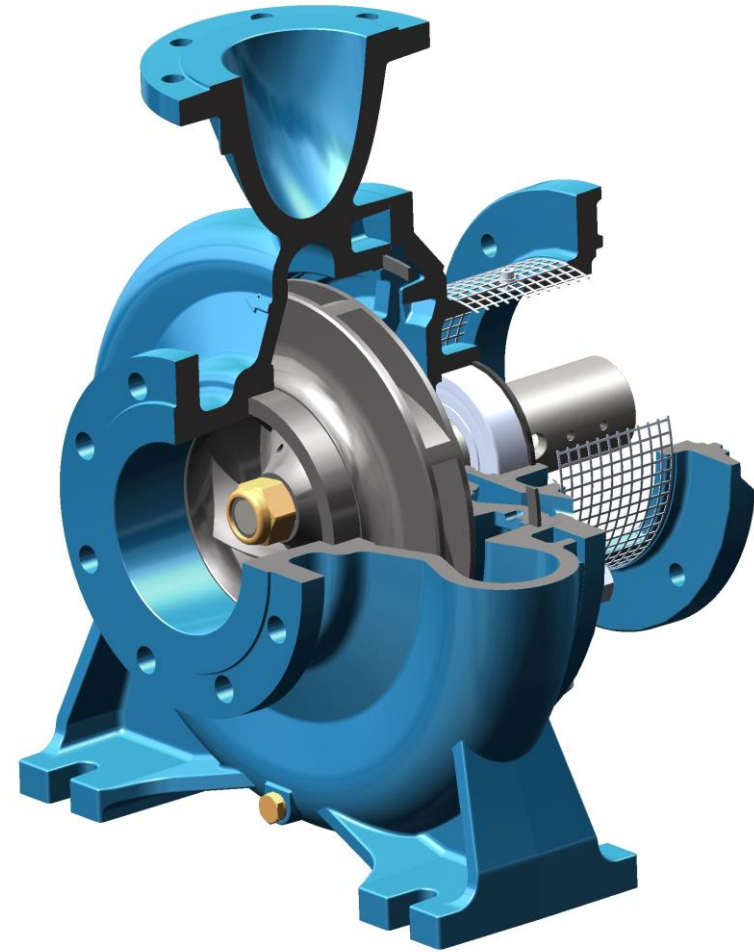
GRUPPI
ANTINCENDIO

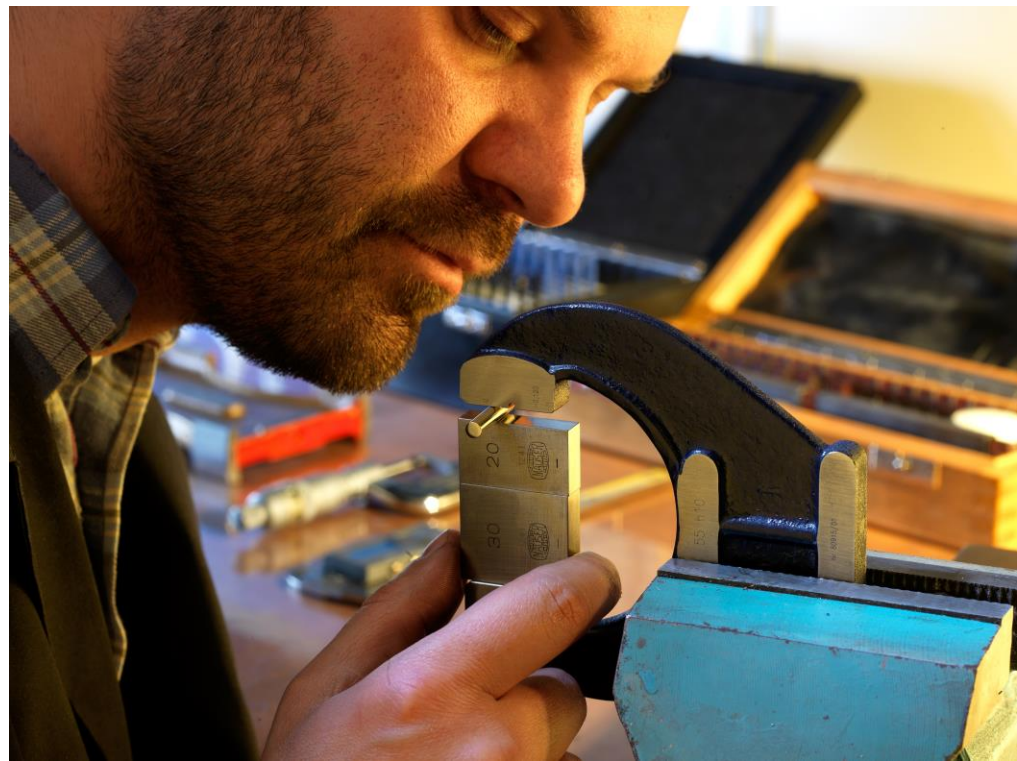


ELETRONICA E
ACCESSORI

PROGETTAZIONE INTEGRATA

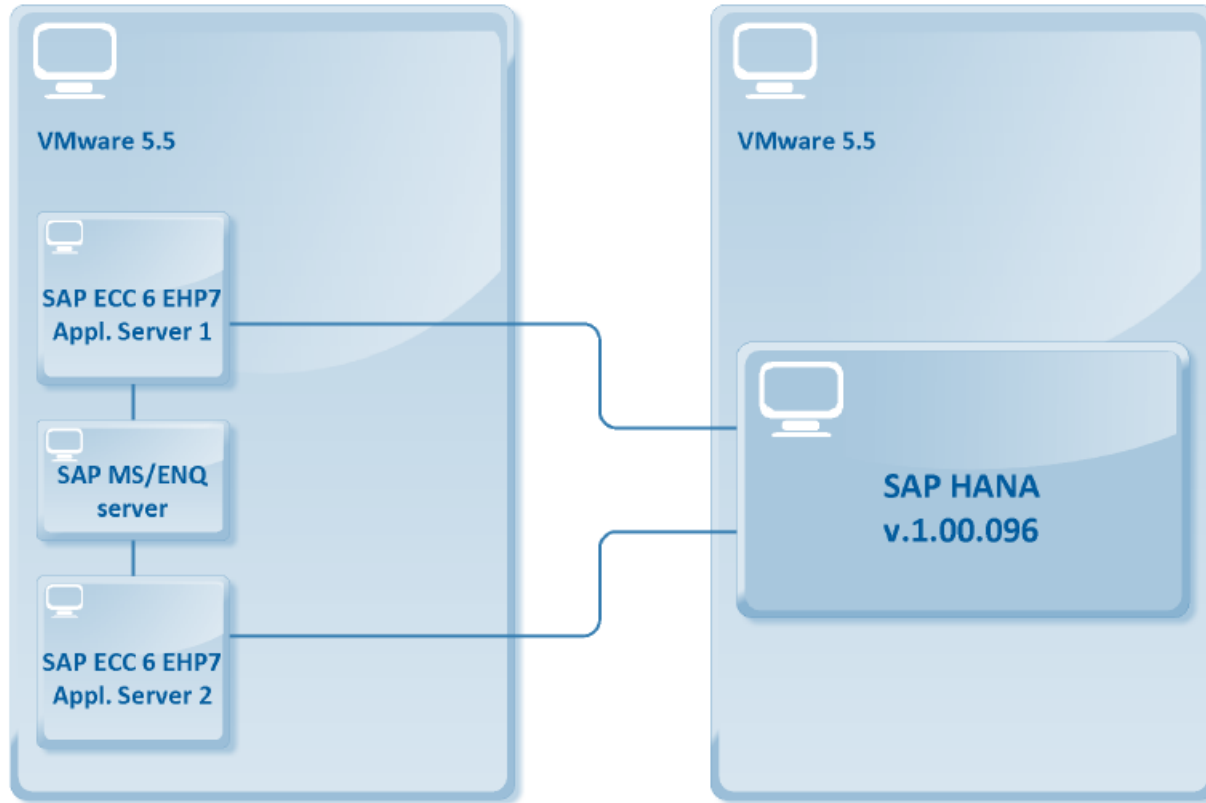
Ogni singolo componente è **sviluppato internamente** al fine di garantire la massima qualità costruttiva e le migliori performance





Ogni singolo prodotto è **prodotto in Italia** e sottoposto a **test e collaudi di verifica dello standard qualitativo**

Architettura SAP HANA ECC





Data Analytics



**Production Process
Monitoring & Control**



**Non Conformance
Management**




**Real-time Change
Production**



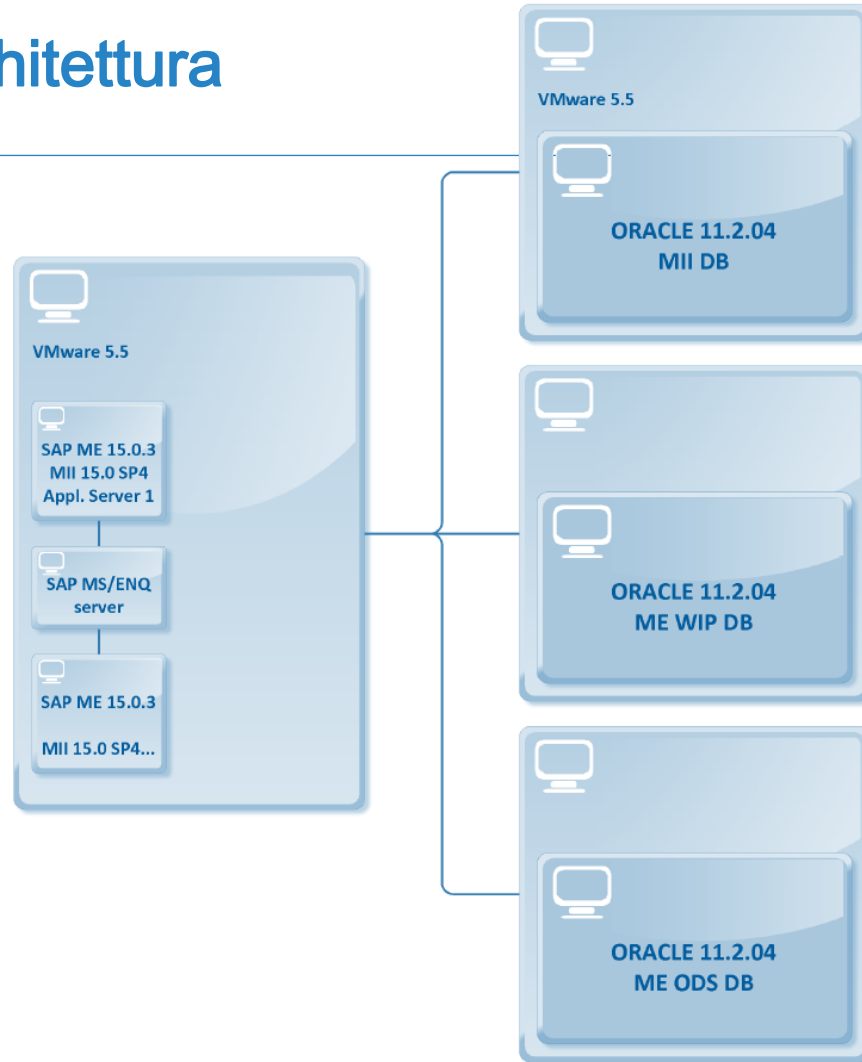
**End-to-End
Traceability**

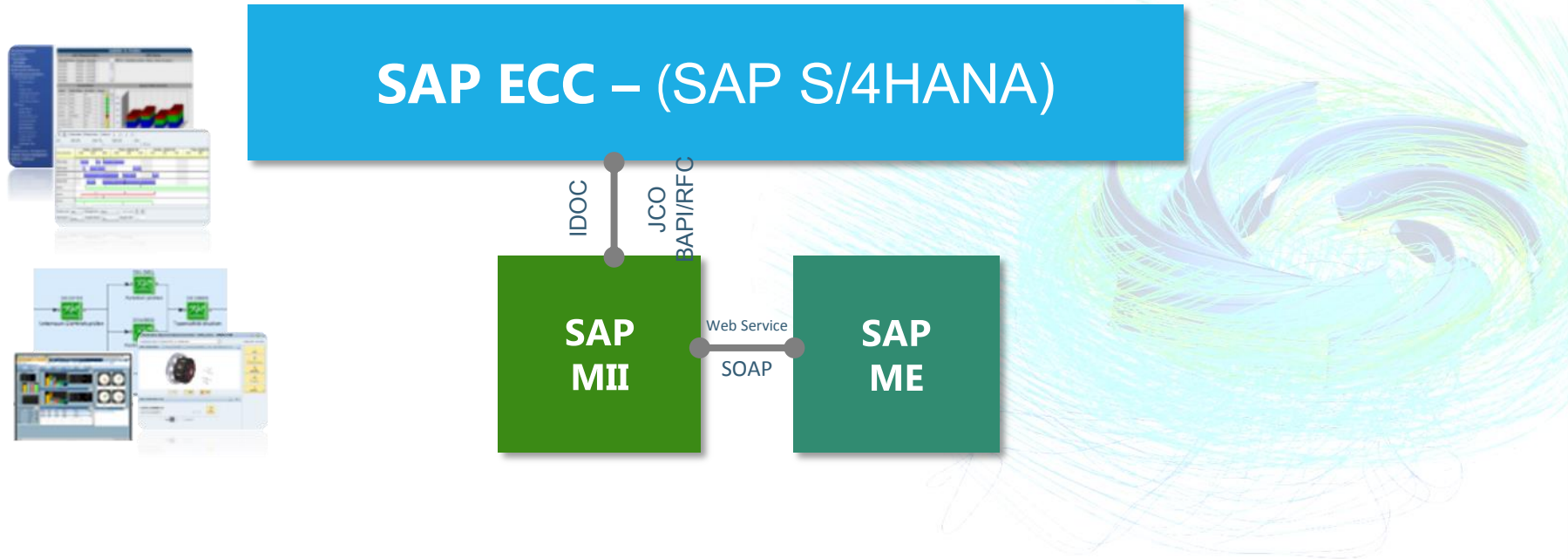
SAP ME – Funzionalità «Out of the Box»



Time Management	Time Sensitive Material
Traceability and Genealogy	Floor Stock Location & Reservations
Shift Management	KPI Management (OEE, ..)
Engineering Change Management	Tool Management
Labor Tracking and Charge Codes	Non Conformance Management
Sampling & Test Plans	Recipe Management
WIP Reporting	In-Process Monitoring, Control and SPC
ERP Integration (Data and Transactional)	MDE Integration (PCo)
Scheduling, Queueing	Skill Certification and Buy off
Electronic Work Instructions	Configuration Management
Dashboards	Parametric Data Collection & SPC
Message Board and Alerts	Resource Status and Plant Maint.

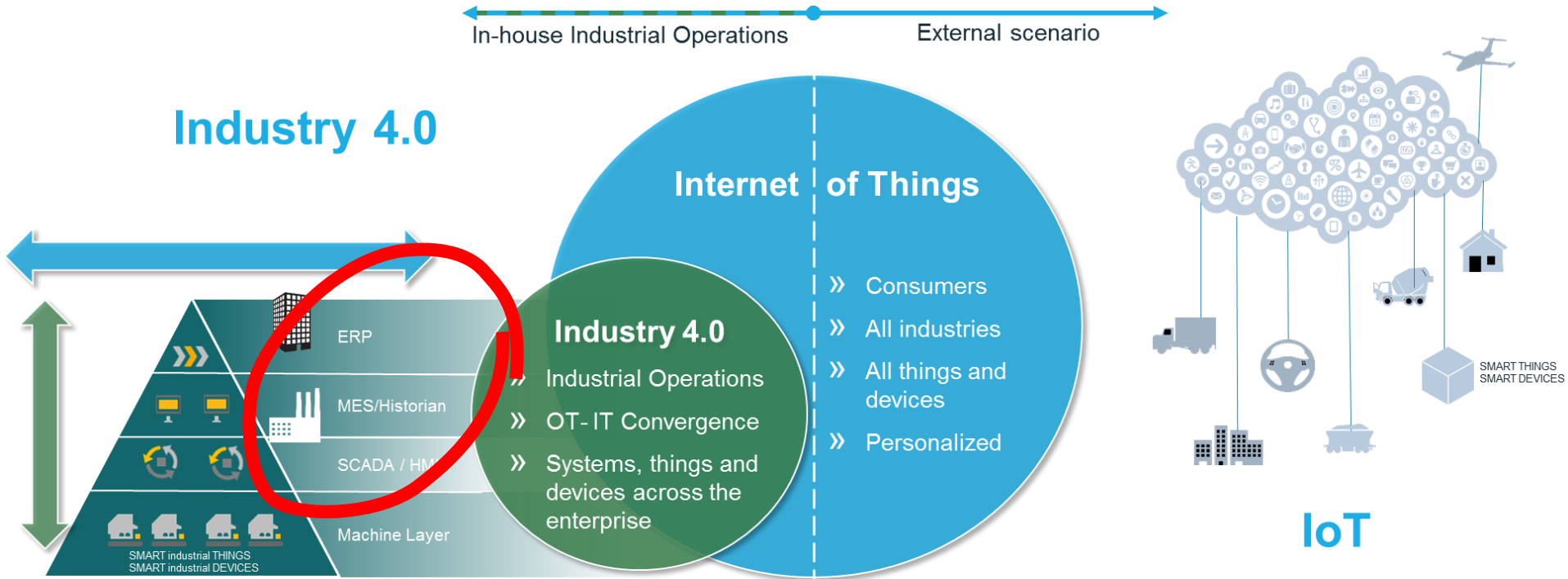
SAP ME – Architettura



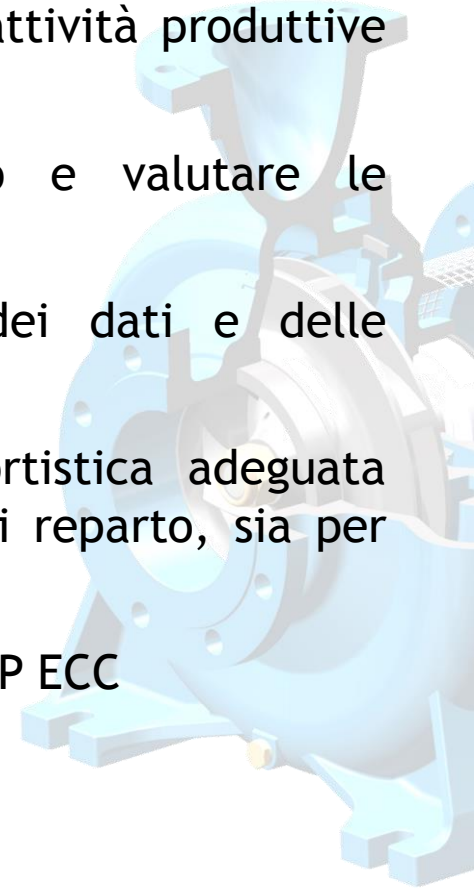


Smart Factories and Digital Manufacturing


Convergence of Industry 4.0 and the Internet of Things



- **Labor Tracking** > rilevare i tempi effettivi delle singole attività produttive per mantenere degli standard adeguati in SAP ECC
- Misurare l'**efficienza** potenziale dei centri di lavoro e valutare le performance produttive rispetto agli standard misurati
- **Ridurre attività manuali** di raccolta e trascrizione dei dati e delle elaborazioni successive per la loro analisi
- Gestire gli **scarti**, la loro tipologia e disporre di reportistica adeguata sull'incidenza degli scarti sia per la produzione interna di reparto, sia per quella ricevuta dagli altri reparti
- Beneficiare dell'**integrazione diretta** del sistema ME con SAP ECC



SAP ME – Funzionalità «Out of the Box»

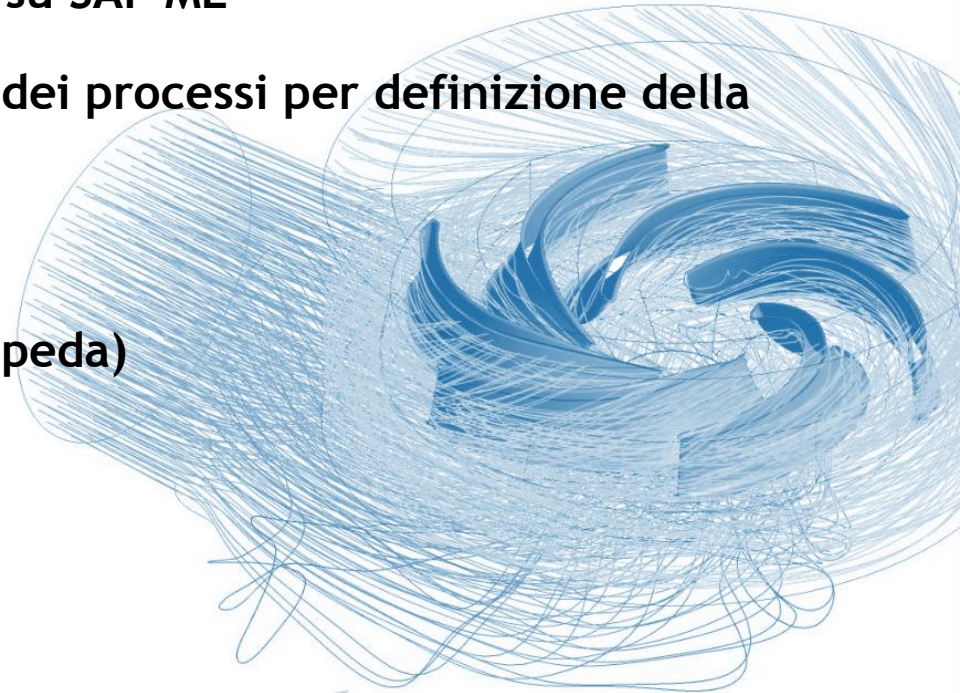


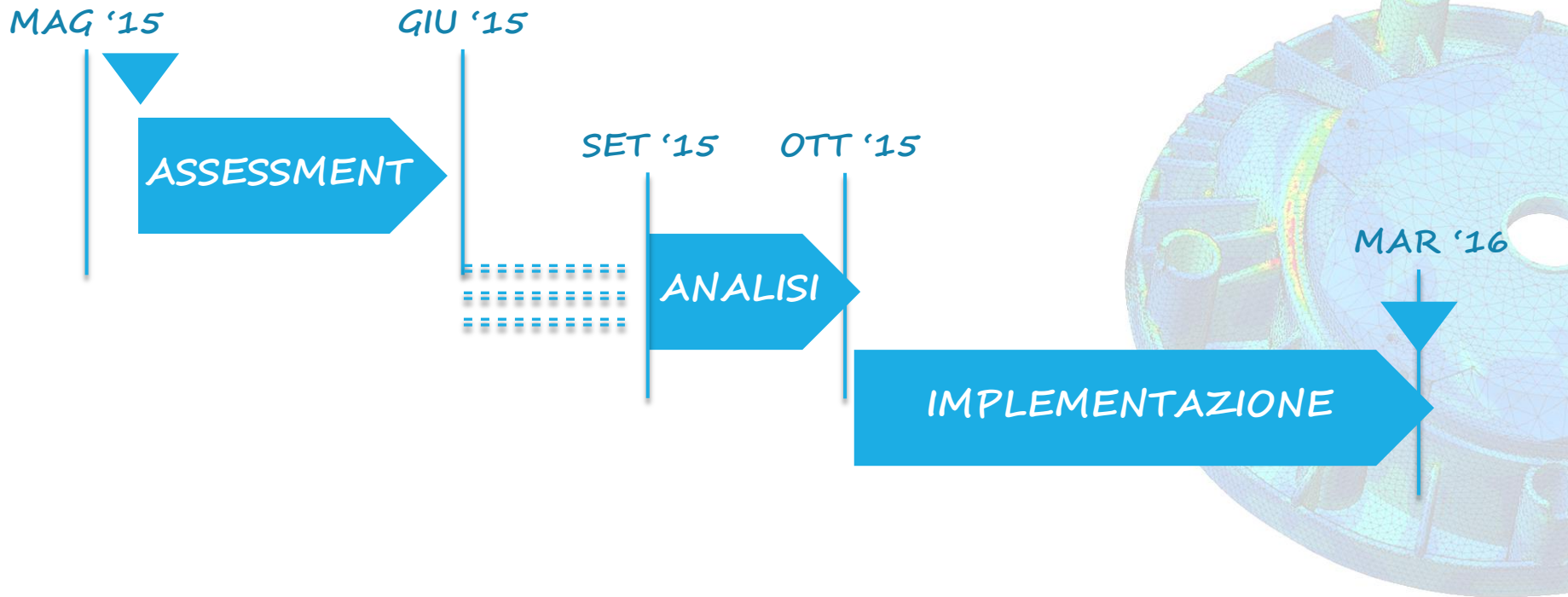
Time Management	Time Sensitive Material
Traceability and Genealogy	Floor Stock Location & Reservations
Shift Management	KPI Management (OEE, ..)
Engineering Change Management	Tool Management
Labor Tracking and Charge Codes	Non Conformance Management
Sampling & Test Plans	Recipe Management
WIP Reporting	In-Process Monitoring, Control and SPC
ERP Integration (Data and Transactional)	MDE Integration (PCo)
Scheduling, Queueing	Skill Certification and Buy off
Electronic Work Instructions	Configuration Management
Dashboards	Parametric Data Collection & SPC
Message Board and Alerts	Resource Status and Plant Maint.

SAP ME – Funzionalità «Out of the Box»

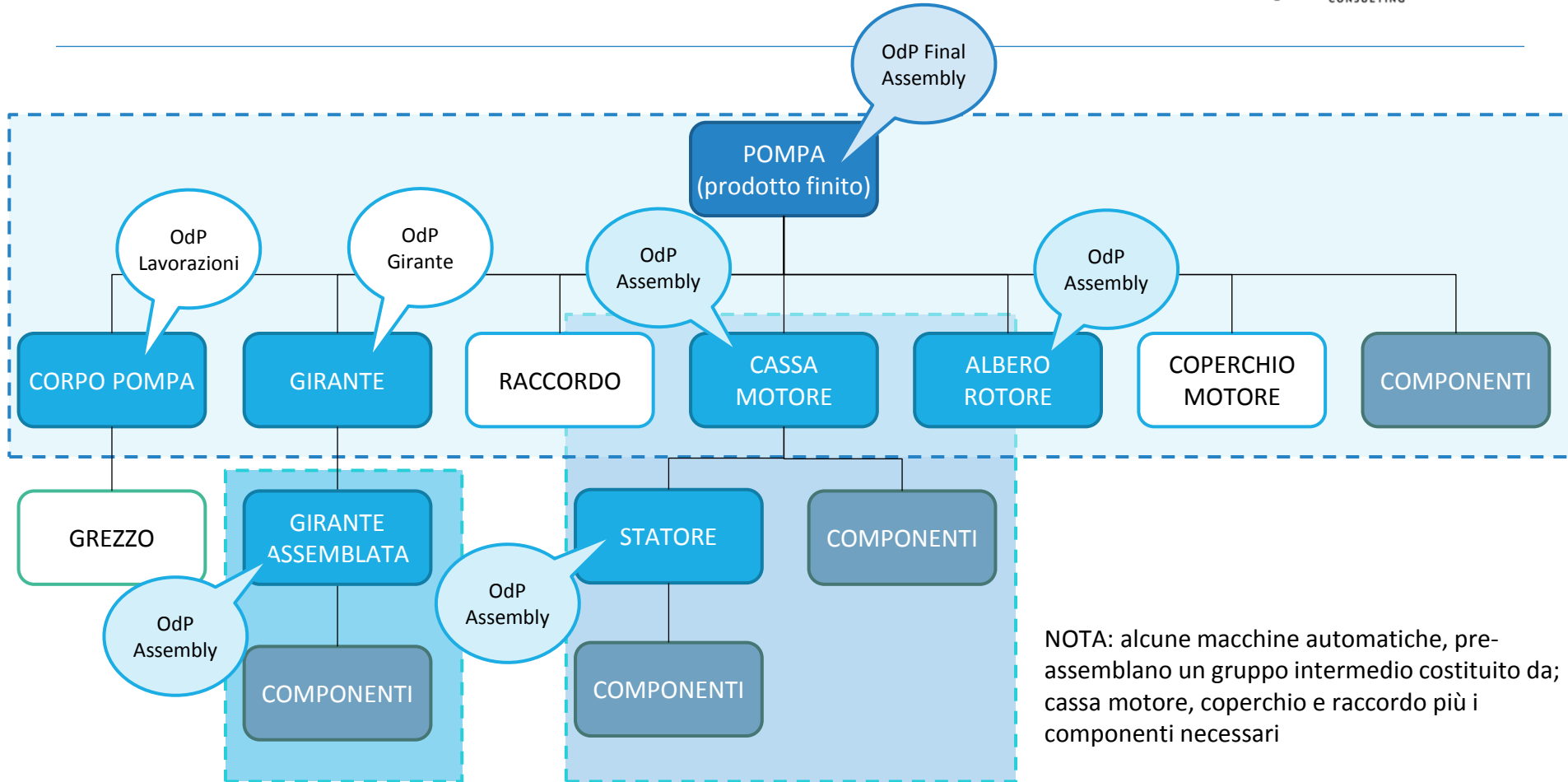
Time Management	Time Sensitive Material
Traceability and Genealogy	Floor Stock Location & Reservations
Shift Management	KPI Management (OEE, ..)
Engineering Change Management	Tool Management
Labor Tracking and Charge Codes	Non Conformance Management
Sampling & Test Plans	Recipe Management
WIP Reporting	In-Process Monitoring, Control and SPC
ERP Integration (Data and Transactional)	MDE Integration (PCo)
Scheduling, Queueing	Skill Certification and Buy off
Electronic Work Instructions	Configuration Management
Dashboards	Parametric Data Collection & SPC
Message Board and Alerts	Resource Status and Plant Maint.

- **Formazione delle risorse IT Calpeda su SAP ME**
- **Assessment preliminare (workshop) dei processi per definizione della strategia di progetto**
- **Analisi dei processi**
- **Co-design del sistema (Espedia + Calpeda)**
- **Solution Build**
- **Rilascio del sistema**















BOM di riferimento e struttura OdP



Home Page



 Orders Release	 Lots List	 Taking & Assembly	 Finishing	 Repair	 Order Confirmation
 Entrance/Exit	 Modify Entrance/Exit Times	 Report Entrance/Exit Times	 Shift Creation		

Order Assignment

Shop order Assignment to Work Center

Selection parameters

Date from:

Date to:

MRP Controller:

Orders Table

Order	Quantity	Material	Description	Priority	MRP Controller	Planned Start
2011486	1	60000251100	NM 17/GE 230/400/50 Hz	500	P06	17-10-2016 16:47:30
2011143	1	60000251100	NM 17/GE 230/400/50 Hz	500	P06	25-10-2016 16:47:30
2011494	1	60000281001	NM 20/160BE 230/400/50 Hz R3-X7X72Z7	500	P06	14-10-2016 16:50:00
2011497	2	6000032108P	NM 25/160BE DIS.4.65.763 V.230/400/50 KW2,2 IE2 X7X72Z7	500	P06	17-10-2016 16:50:00
2011146	3	60000331021	NM 25/160AE-60 220/380/60 Hz GIR.A-144 60HZ	500	P06	17-10-2016 16:50:00
2011460	84	60010010000	NM 1/AE 230/400/50 Hz	500	P06	13-10-2016 16:50:00
2011530	6	6001001000K	NM 1/AE 230/400/50 Hz R5H2-EYXYKRY GIR:120 GUARN. FPM DADO E CONTRO...	500	P06	13-10-2016 16:50:00
2011501	2	60010010025	NM 1/AE 230/400/50 Hz R3-X7H72V7	500	P06	14-10-2016 16:50:00
2011502	1	60010300001	NM 25/12B/A 230/400/50 Hz R3-X7X72Z7	500	P06	19-10-2016 16:50:00
2011505	1	6001031003T	NM 25/12A-60/A 265/460/60 Hz R3-X7X72Z7 GIR.A-114 60HZ	500	P06	19-10-2016 16:50:00

W.C. Selection for release

W.C.:

Queued lots in W.C.

Lot	Status	Priority	Total qty
20161012-0014	Active	400	25
20161012-0013	InQueue	400	20

Production Queue Management

←
Modify Process Lots
⏻

Lot Selection

Lot: Search

Date from: 📅

Date to: 📅

Order Selection

Order: Search

Lots Table

📄 Create new Process Lot from selection
 In work
 Historical

LOTS NAVIGATION		MATERIAL	DESCRIPTION		WC		TYPE	PRIORITY		
20161013-0008				🖨	M26B	📄	LOT	500	📄	+
2011476	<input type="checkbox"/>	70B00044105	NGM 6/18E DIS.90.070 V.220/50 CON CAVO				ORDER			-
20161012-0012				🖨	M26B	📄	LOT	400	📄	+
2011093	<input type="checkbox"/>	60300042000	NMDM 20/140BE 230/50 Hz				ORDER			-
20161012-0013				🖨	M26A	📄	LOT	400	📄	+
2011091	<input type="checkbox"/>	60F00901000	A 50-125AE 230/400/50 Hz				ORDER			-
2016495052	<input type="checkbox"/>						SERIAL			↻
2016495053	<input type="checkbox"/>						SERIAL			↻
2016495054	<input type="checkbox"/>						SERIAL			↻
2016495055	<input type="checkbox"/>						SERIAL			↻
2016495056	<input type="checkbox"/>						SERIAL			↻
2016495057	<input type="checkbox"/>						SERIAL			↻
2016495058	<input type="checkbox"/>						SERIAL			↻
2016495059	<input type="checkbox"/>						SERIAL			↻
2016495060	<input type="checkbox"/>						SERIAL			↻


Line Operation POD

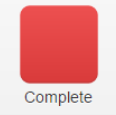
←
POD
⏻


WORK CENTER:

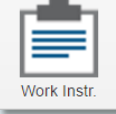
M26A


Users:01000236,01000600


Start


Complete


Signoff



Work Instr.



Std Picking


PROCESS LOT		STATUS	PRIORITY	QUANTITY
20161012-0014	▲	Active	400	25
20161012-0013	◆	In Queue	400	20

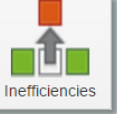
ORDER	MATERIAL	DESCRIPTION	QUANTITY
2011094	60300042000	NMDM 20/140BE 230/50 Hz	25


OPERATION		STATUS
MONTAGGIO	▲	Active
PRELIEVO	■	Completed


Clock In


Clock Out



BOM




Inefficiencies


NC

Finishing POD

← **POD** ⏻

WORK CENTER:  Users: 01000138,01000234,01000590



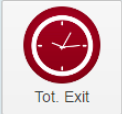
Cadence (seconds):  Pallet: 



Serial:

LAST CONFIRMED SERIALS	ORDER	MATERIAL	DESCRIPTION	CONFIRMED ON
2016494799	2011090	60F00901000	A 50-125AE 230/400/50 Hz	13/10/2016 15:36:21
2016494798	2011090	60F00901000	A 50-125AE 230/400/50 Hz	13/10/2016 15:33:54
2016494797	2011090	60F00901000	A 50-125AE 230/400/50 Hz	13/10/2016 15:32:25
2016494796	2011090	60F00901000	A 50-125AE 230/400/50 Hz	13/10/2016 15:31:25
2016494792	2011090	60F00901000	A 50-125AE 230/400/50 Hz	13/10/2016 15:30:05

NOTES FOR ORDER 2011090

No note for production order

Integrated Confirmations/Reversal



← Order Confirmation ⏻

Order Confirmation

ORDER:

QUANTITY:

FINAL CONFIRMATION PARTIAL CONFIRMATION

Cancel Confirmation

ORDER:

Quantity	Final Conf.	Date
No data		

Cancel


Labor Time Management

←
Users Entrance and Exit
⏻


WORK CENTER:

M26A

📄
✎




Shift Entrance




Daily Entrance

ACTIVITY
Attività standard (diretta)
Attività indiretta
Manutenzione cabine di vernic...
Magazzino ricambi
Pulizia/riordino reparto


UTENTE	ORA - DATA
01000600	14:40:36 - 13/10/2016
01000236	14:25:23 - 13/10/2016
01000600	13:19:03 - 13/10/2016
01000236	13:19:00 - 13/10/2016
01000600	11:51:02 - 13/10/2016



Exit



Exit (15 min)



Exit (30 min)

UTENTE	ORA - DATA
01000600	14:40:01 - 13/10/2016
01000236	14:23:50 - 13/10/2016
01000236	12:00:03 - 13/10/2016
01000600	12:00:01 - 13/10/2016
01000236	11:46:04 - 13/10/2016

Shifts Management



←
Insert Shifts
⏻

FROM HOURS:

TO HOURS:

MINUTES:

MINUTES:

TYPE:

IN - OUT:

TIME FROM	TIME TO	TYPE	IN - OUT	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.	MOD.	CANC.
04:40	05:00	DAILY	ENTRANCE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
05:30	05:50	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
06:00	06:20	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
06:30	06:50	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
07:00	07:20	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
07:30	07:50	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
08:00	08:20	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
08:30	08:50	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
12:15	12:30	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
12:38	12:50	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
12:40	13:00	DAILY	ENTRANCE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>
13:00	13:20	DAILY	ENTRANCE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="✎"/>	<input type="button" value="✖"/>

Operators Time Log



REPORT TIME LOG									
USER	WC	START DATE	START TIME	END DATE	END TIME	PAUSE	TOTAL	IN PROGRESS	ACTIVITY
01000600	M26A	13-10-2016	08:22	13-10-2016	08:33		00:11		Attività stand...
01000236	M26A	13-10-2016	08:27	13-10-2016	09:00		00:32		Attività stand...
01000600	M26A	13-10-2016	08:34	13-10-2016	09:00		00:25		Attività stand...
01000236	M26A	13-10-2016	09:15	13-10-2016	10:13		00:58		Attività stand...
01000600	M26A	13-10-2016	09:15	13-10-2016	10:13		00:58		Attività stand...
01000236	M26A	13-10-2016	10:14	13-10-2016	11:46		01:31		Attività stand...
01000600	M26A	13-10-2016	10:14	13-10-2016	11:46		01:31		Attività stand...
01000236	M26A	13-10-2016	11:50	13-10-2016	12:00		00:09		Attività stand...
01000600	M26A	13-10-2016	11:51	13-10-2016	12:00		00:08		Attività stand...
01000236	M26A	13-10-2016	13:19	13-10-2016	14:23		01:04		Attività stand...
01000600	M26A	13-10-2016	13:19	13-10-2016	14:40		01:20		Attività stand...
01000236	M26A	13-10-2016	14:25	13-10-2016	15:45		01:19	X	Attività stand...

Work Center Yield Report

* Site: DS00

* Date Range: Today

▲ Material:

* 10/19/2016 12:00:00 AM

Operation:

* 10/19/2016 11:59:59 PM

▲ Work Center: M26A

Resource:

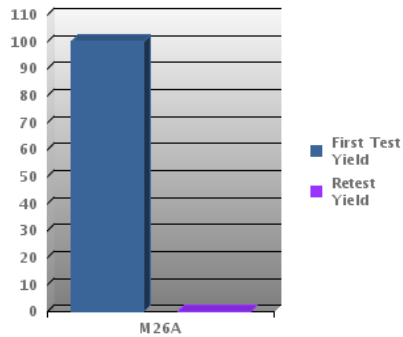
Operation Type: All

Search Clear

Show Results

WORK CENTER YIELD REPORT

Site: DS00 Work Center: M26A Operation Type: All
Date Range: Today From Date/Time: Oct 19, 2016 12:00:00 AM To Date/Time: Oct 19, 2016 11:59:59 PM



Production Report



Main

Miscellaneous

* Site: DS00

* Date Range: This Year

▲ Material: 60000370310

Version:

* 01/01/2016 12:00:00 AM

Operation:

Resource:

* 12/31/2016 11:59:59 PM

Show Results in New Window

PRODUCTION REPORT

Site: DS00

Material/Vers.: 60000370310/

Order Type: Production

Work Center Category: All

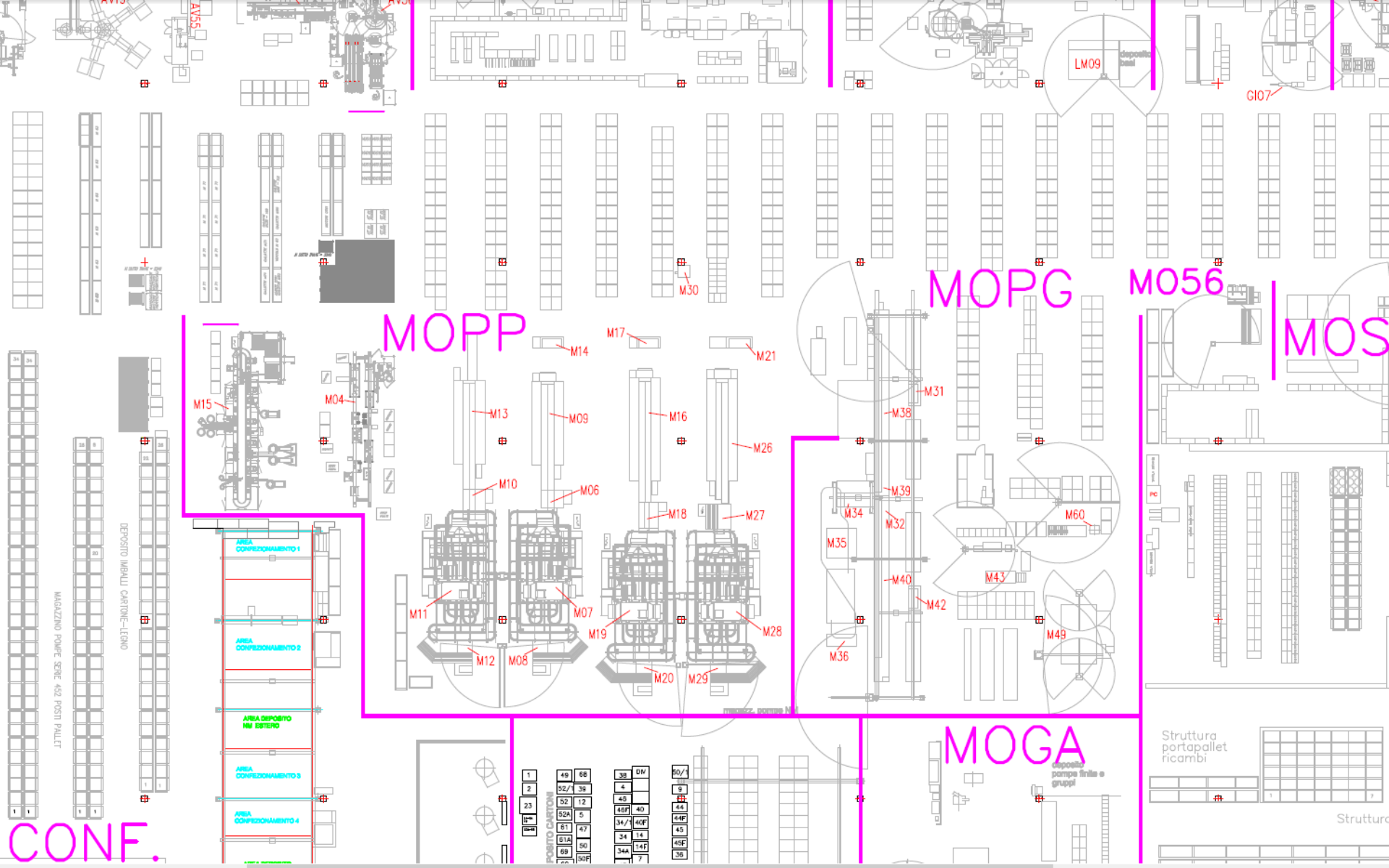
From Date/Time: Jan 1, 2016 12:00:00 AM

To Date/Time: Dec 31, 2016 11:59:59 PM

DATE TIME	MATERIAL/VERS.	OPERATION	RESOURCE	WORK CENTER	QTY COMPLETED	QTY NC
Feb 19, 2016 11:43:08 AM	60000370310/A	PRELIEVO	DEFAULT	M26A	25	0
Feb 19, 2016 1:03:25 PM	60000370310/A	PRELIEVO	DEFAULT	M26B	25	0
Feb 19, 2016 3:49:03 PM	60000370310/A	MONTAGGIO	DEFAULT	M26B	25	0
Feb 19, 2016 3:52:30 PM	60000370310/A	MONTAGGIO	DEFAULT	M26A	25	0
Feb 22, 2016 10:36:40 AM	60000370310/A	FINITURA	DEFAULT	M29	1	0
Feb 22, 2016 10:37:58 AM	60000370310/A	FINITURA	DEFAULT	M29	1	0
Feb 22, 2016 10:39:48 AM	60000370310/A	FINITURA	DEFAULT	M29	1	0
Feb 22, 2016 10:42:19 AM	60000370310/A	FINITURA	DEFAULT	M29	1	0
Feb 22, 2016 10:43:38 AM	60000370310/A	FINITURA	DEFAULT	M29	1	0
Feb 22, 2016 10:45:21 AM	60000370310/A	FINITURA	DEFAULT	M29	1	0

- **200 dipendenti** che utilizzano i vari POD di ingresso/uscita, dislocati nei relativi reparti, per **tracciare gli spostamenti** ed avere un time sheet per ogni persona
- I dati raccolti sono utilizzati dalle funzioni di produzione e risorse umane per generare **statistiche** ed elaborare **quadrature**
- Per quanto riguarda i processi produttivi di montaggio, **6 linee** con circa **50 operatori** che utilizzano il sistema di **avanzamento ME** per la gestione dell'ordine di produzione nelle fasi di:
 - dispatching degli ordini di produzione
 - prelievo del materiale
 - montaggio del prodotto finito e finitura
 - versamento a magazzino

- **Consolidare** l'implementazione completata quest'anno ed estenderla a tutte le linee comprese quelle automatizzate
- **Reporting:** garantire dati aggiornati disponibili in modo semplice. Quadrature tra dati rilevati e tempi standard
- Gestione delle **Non Conformità** ed integrazione con **SAP QM**
- Gestione delle **inefficienze**
- **Serializzazione** dei prodotti e tracciabilità
- **Personalizzazioni** clienti
- Integrazione documentale: **istruzioni di lavoro** digitali a bordo linea



MOPP

MOPG

MO56

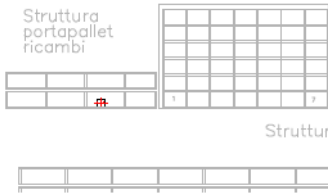
MOS

MOGA

CONF.

1	48	66	38	DW	50/1
2	52/1	39	4		3
	52	12	45		44
	52A	5	45P	40	44P
23	61	47	34/1	40P	45
	61A	50	34	14	45E
	69	47	34A	14F	36
	150P		7		

POSITO CARTONI



dispositivi pompe finite e gruppi

C107

LM09

DEPOSITO IMBALLI CARTONE-LEGNO

MACCHINAZIONE POWER SERIE 442 POSTI PALLET



M15

M04

M13

M09

M16

M26

M31

M10

M06

M18

M27

M39

M60

M11

M07

M19

M28

M34

M32

M43

M12

M08

M20

M29

M40

M42

M49

M36

M30

M17

M14

M21

M38

M35

M32

M43

M49

M31

M42

M49

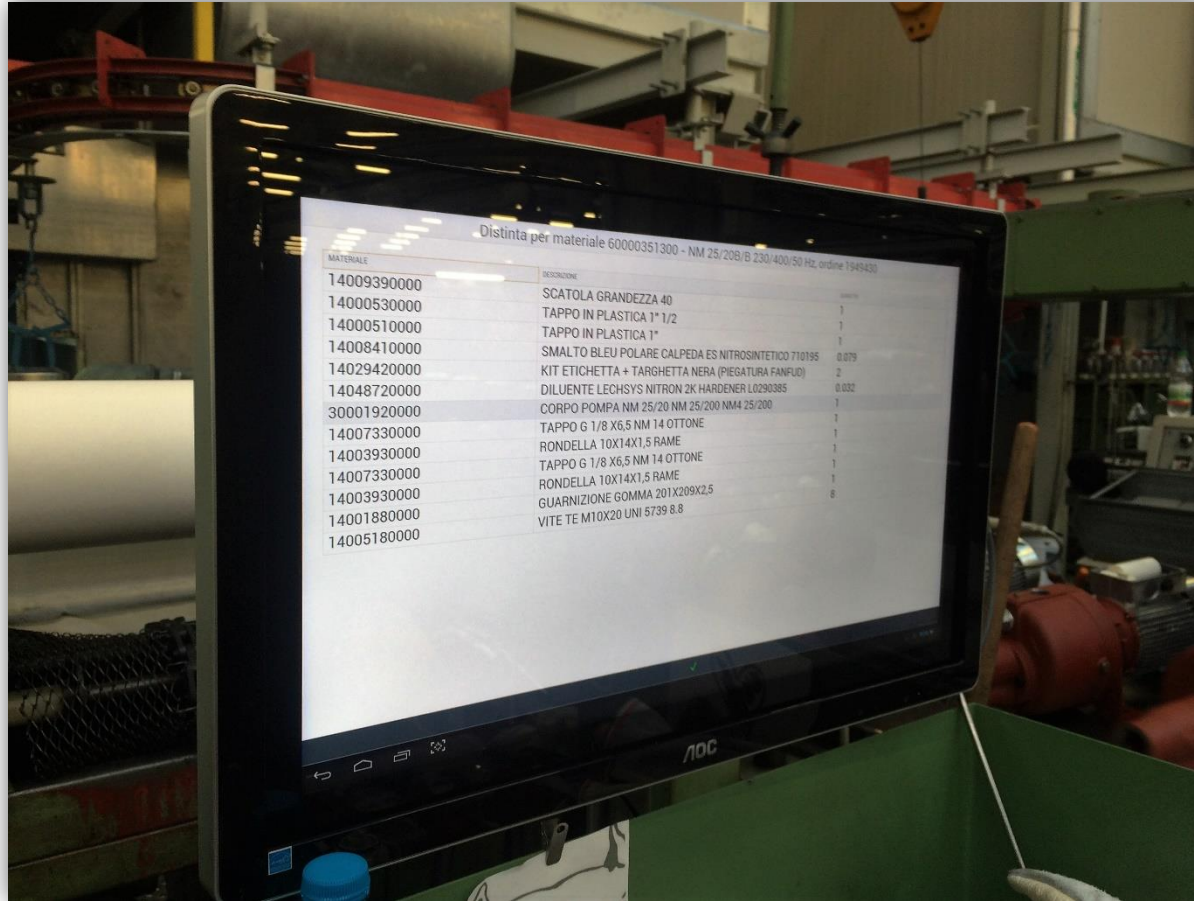
M49

M49

M49

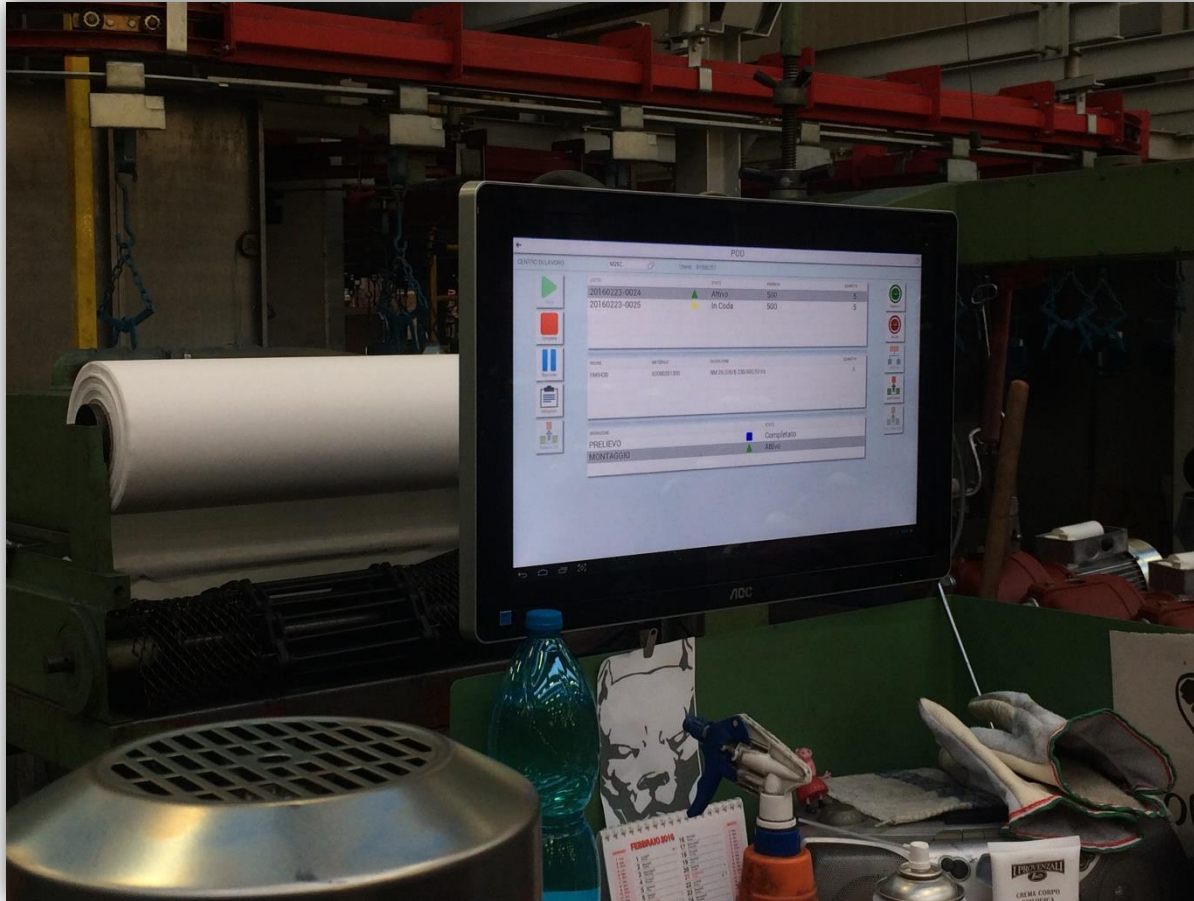
M49

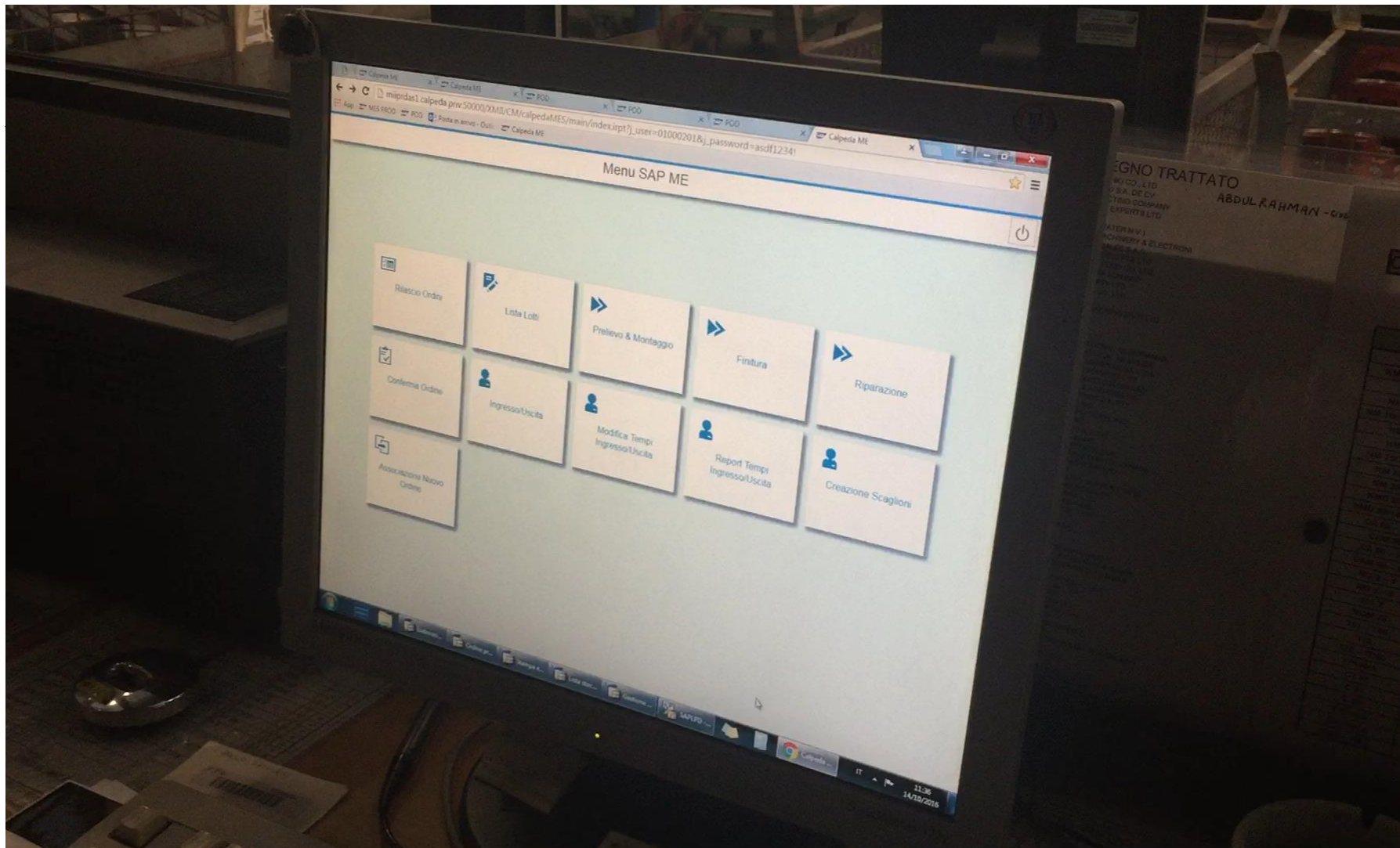




Distinta per materiale 60000351300 - NM 25/20B/B 230/400/50 Hz, ordine 1949430

MATERIALE	DESCRIZIONE	QUANTITÀ
14009390000	SCATOLA GRANDEZZA 40	1
14000530000	TAPPO IN PLASTICA 1" 1/2	1
14000510000	TAPPO IN PLASTICA 1"	1
14008410000	SMALTO BLEU POLARE CALPEDA ES NITROSINTETICO 710195	0,079
14029420000	KIT ETICHETTA + TARGHETTA NERA (PIEGATURA FANFLID)	2
14048720000	DILUENTE LECHSYS NITRON 2K HARDENER L0290385	0,032
30001920000	CORPO POMPA NM 25/20 NM 25/200 NM4 25/200	1
14007330000	TAPPO G 1/8 X6,5 NM 14 OTTONE	1
14003930000	RONDELLA 10X14X1,5 RAME	1
14007330000	TAPPO G 1/8 X6,5 NM 14 OTTONE	1
14003930000	RONDELLA 10X14X1,5 RAME	1
14003930000	GUARNIZIONE GOMMA 201 X209X2,5	8
14001880000	VITE TE M10X20 UNI 5739 8.8	
14005180000		





Operiamo come Partner di riferimento per migliorare:



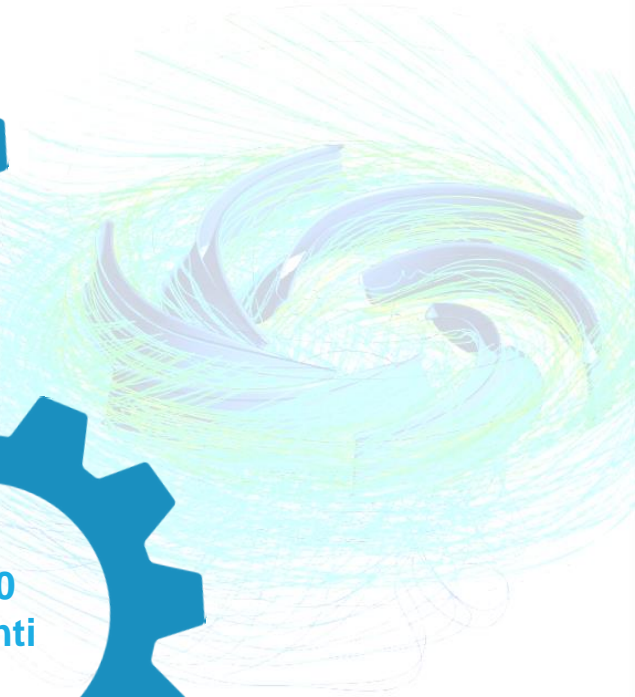
I processi di innovazione di
prodotto e di processo



L'integrazione fra il mondo
dell'Engineering e il mondo del
Manufacturing



Il lancio di nuovi
prodotti sul
mercato



Contatti

Marco Artioli

Managing Director – I4.0

marco.artioli@espedia.it

www.espedia.it

