


# MES Control Centre – The essential control unit for modern bakeries



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- Short introduction to ProLeiT**
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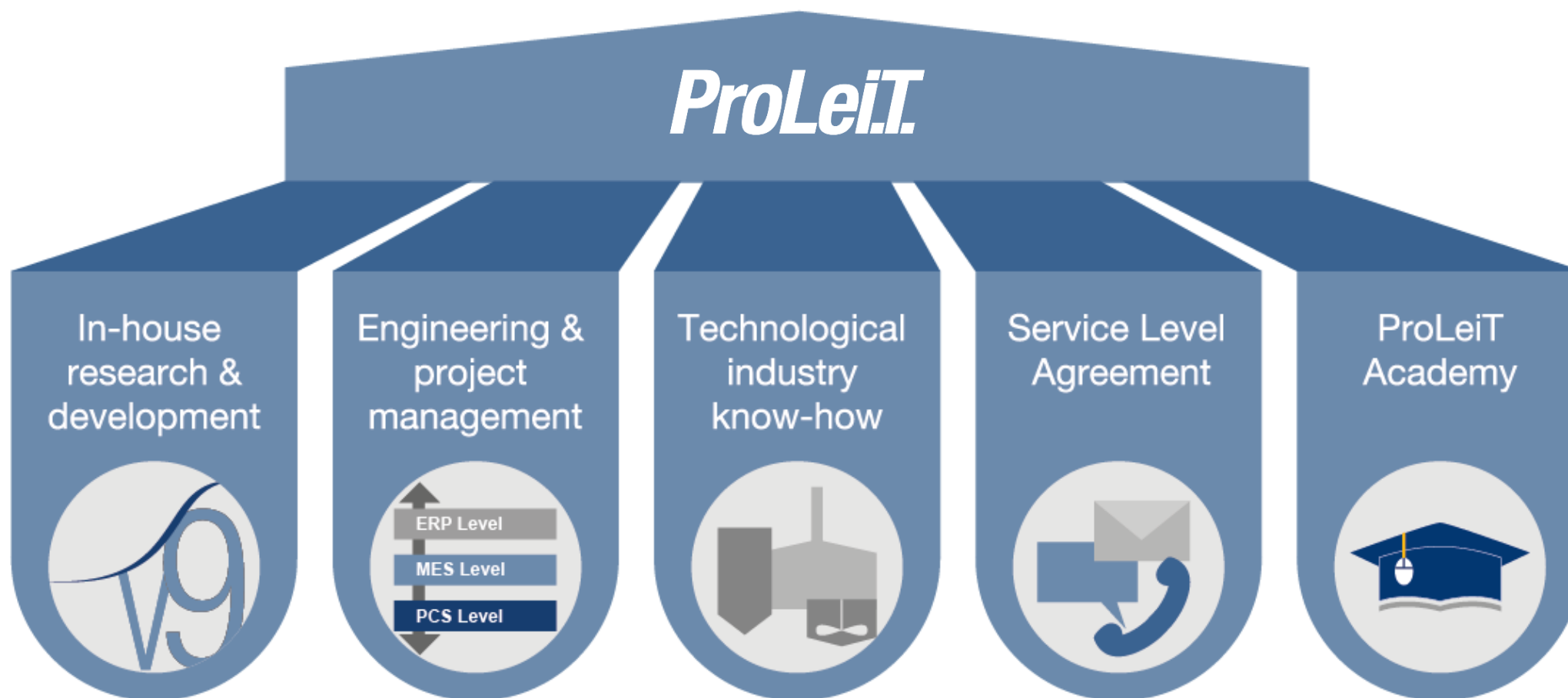
## Facts and Figures










- **Foundation (1986):**
  - Wolfgang Ebster & Manfred Czepl
- **Employees (State: 2018-11-22):**
  - 500 (ProLeiT Group)
  - 376 (ProLeiT AG)
  - therefrom 70 apprentices

- **Locations:**
  - 5 locations in Germany
    - Herzogenaurach (HQ), Halle, Hannover, Leverkusen, Kitzingen
  - 11 international locations
    - Austria, Brazil, Bulgaria, China, Mexico, Russia (2x), Spain, The Netherlands, Ukraine, USA
- **Business areas**
  - Project business
    - Specifying, engineering and commissioning application-specific solutions for the process industry
  - Product business
    - Developing and marketing system software (PCS & MES)
- **Core industries**
  - Brewing, dairy, food industry
  - Chemical and pharmaceutical industry
  - Agricultural industry

## Service portfolio

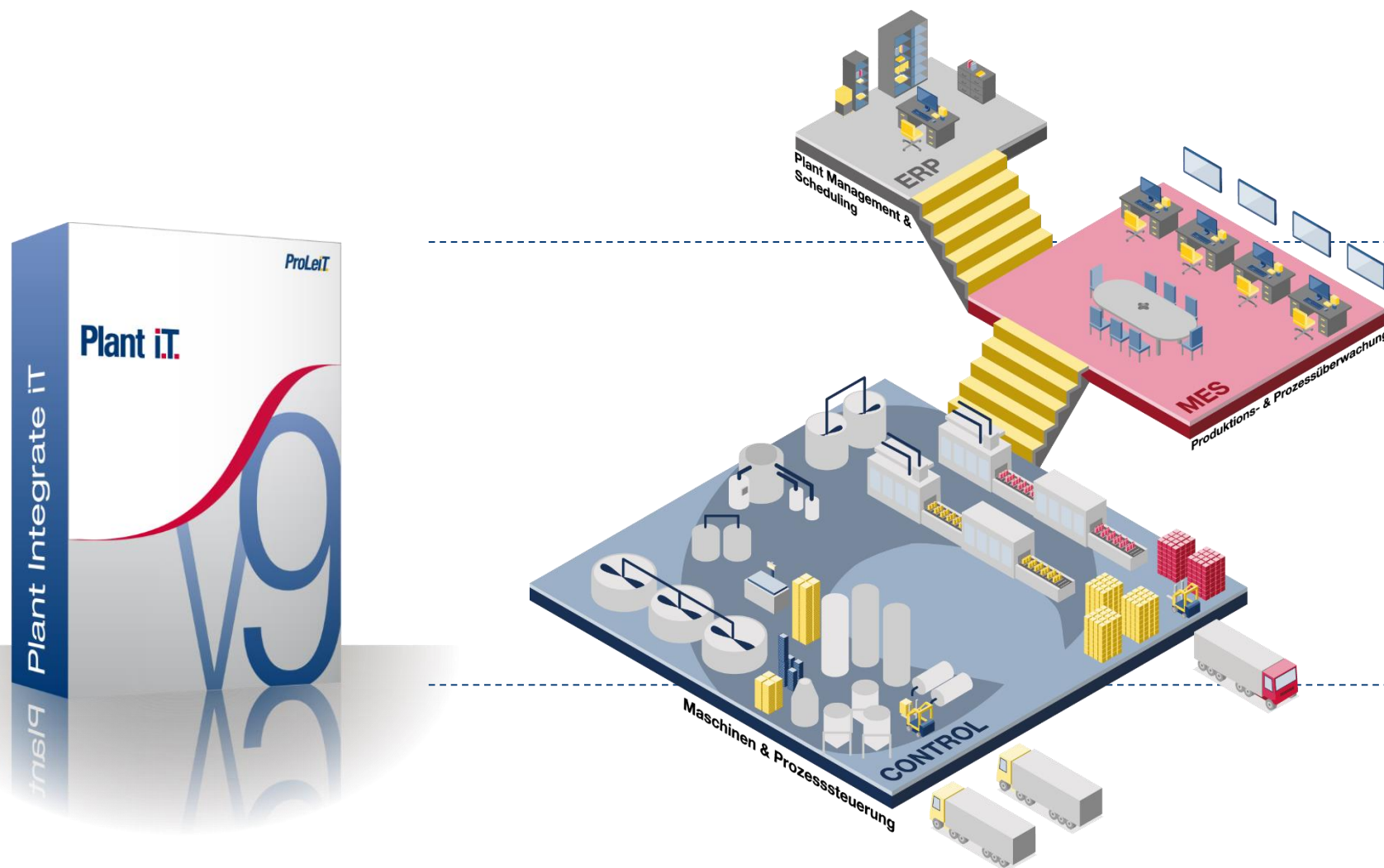


## Actual situation – Pain Points

-  Isolated Applications – chosen by technological functionality rather than connectivity
-  Complete overview of all lines in one plant is missing
-  ERP-orders are distributed manually, manual detail planning
-  Packaging doesn't know what is happening in the production area and otherwise
-  Manual processes – handover of routing slips is slowly and fault-prone
-  Adaption of recipes not traceable
-  Data recording and –analysis is handled differently in different systems

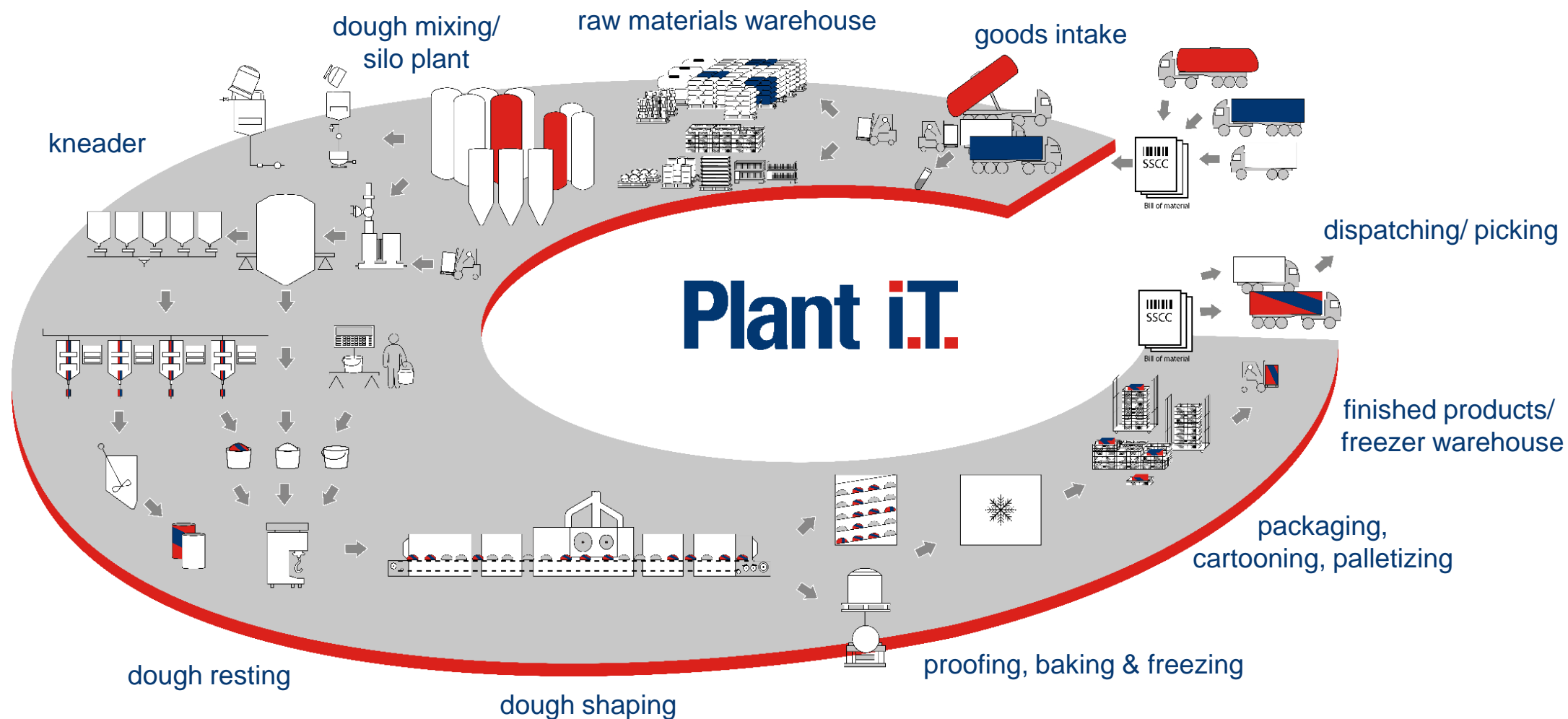
# System landscape

Typically: Control, MES, ERP



# Value chain

Integrated solutions concept with Plant iT for industrial bakeries



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## Status overview

	Silo / Dough mixing	Kneader	Dough shaping / dough resting	Oven	Packaging
Toast - Line 1	running	running	running	running	running
Baguette - Line 2	running	running	running	running	
Bread rolls - Line 1	on hold	on hold	on hold	on hold	
Ciabatta - Line 2	running	running	running	running	
Croissant - Line 3	running	running	running	running	
initial state	running	on hold	error		

## Status overview

	Silo / Dough mixing	Kneader	Dough shaping / dough resting	Oven	Packaging
Toast - Line 1	running	error	running	running	running
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Bread rolls - Line 1	running	running	running	running	
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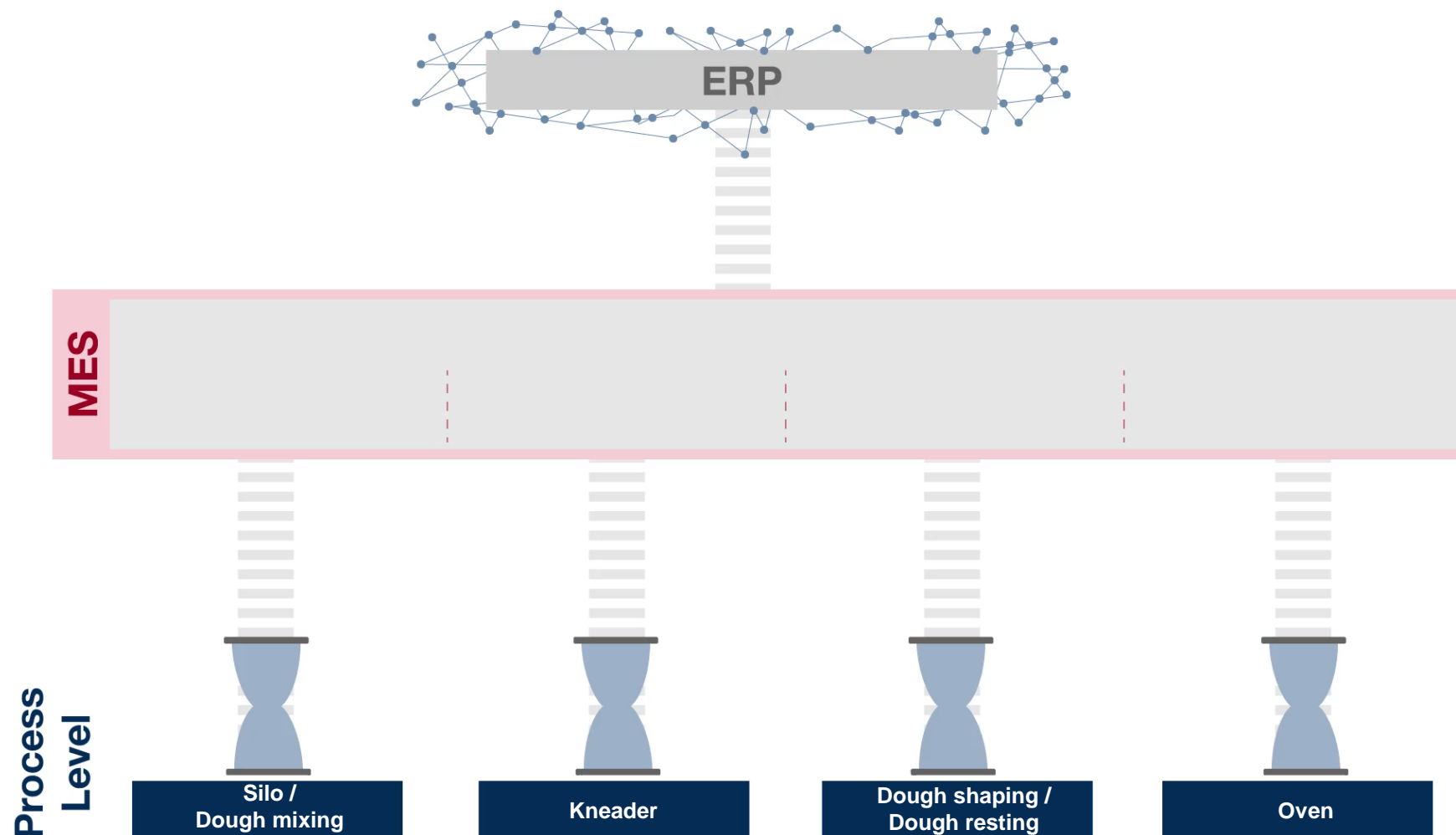


Adaption of recipes not traceable

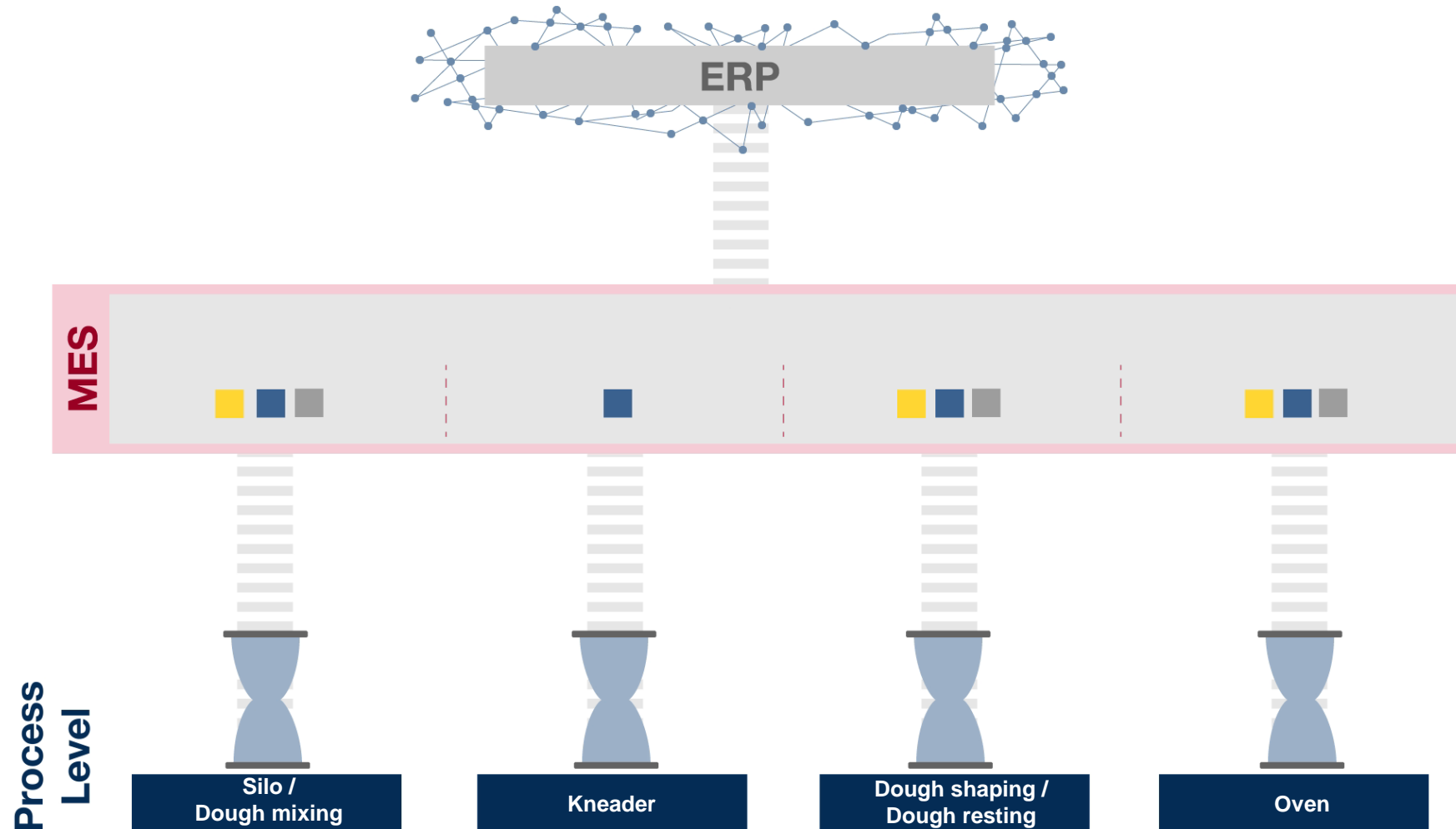


Data recording and –analysis is handled differently in different systems

# Order overview

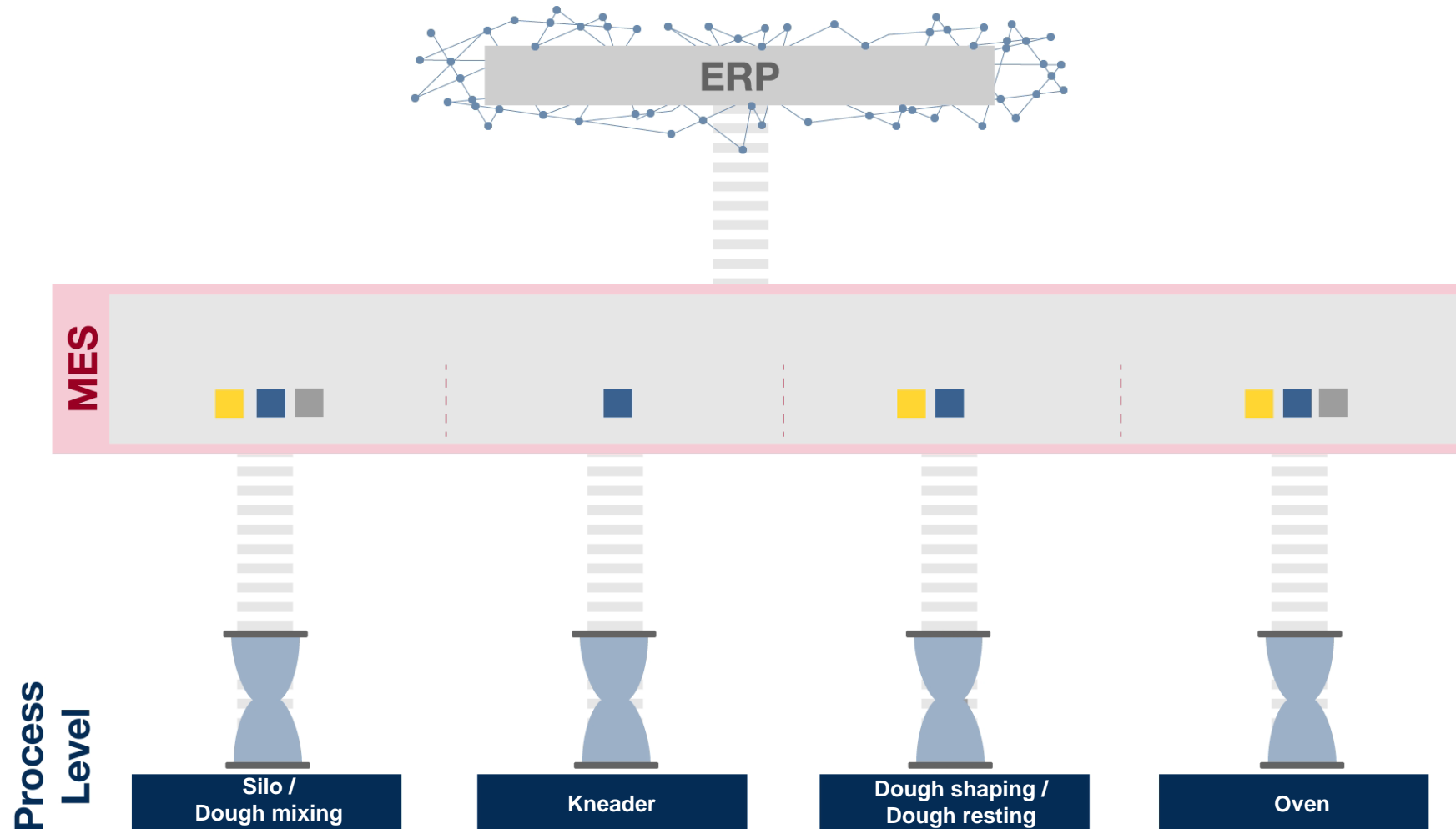


# Order overview





# Order overview



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# Orderlist

- **Order list**
  - One order list for the complete plant – including packaging
  - All states clearly arranged on one page

Auftragsnummer	Mat. Nr.	Geplanter Start	Startzeit	Geplanter Stopp	Geplante Menge	Produzierte Menge	Einheit	Fortschritt	Zustand	Rezept
▼ Auftragsstyp: Produktionsauftrag										
► Maschinengruppe:										
► Maschinengruppe: 2A										
► Maschinengruppe: 2B										
► Maschinengruppe: 2C										
► Maschinengruppe: 2F										
▼ Maschinengruppe: 2P										
209098_78	78	14.02.2019 00:00:00		15.02.2019 00:00:00	10.500,00	0,00	KG		Leerlauf	78
209056_200	200	11.02.2019 00:00:00	06.02.2019 13:43:49	13.02.2019 00:00:00	13.100,00	0,00	KG		An PLS gesendet	390
209457_78	78	08.02.2019 00:00:00	05.02.2019 14:20:24	11.02.2019 00:00:00	14.000,00	0,00	KG		Läuft im PLS	78
▼ Maschinengruppe: 2T										
208226_6015	6015	06.02.2019 00:00:00	01.02.2019 10:11:37	07.02.2019 00:00:00	14.286,00	14.282,00	KG		Qualitätskontrolle..	6006
209096_36	36	12.02.2019 00:00:00		13.02.2019 00:00:00	13.000,00	0,00	KG		Leerlauf	36_1
209879_32	32	11.02.2019 00:00:00	06.02.2019 13:45:06	12.02.2019 00:00:00	10.000,00	0,00	KG		Pickliste generiert	32
▼ Maschinengruppe: 2S										
209511_203	203	07.02.2019 00:00:00	04.02.2019 13:46:40	08.02.2019 00:00:00	7.300,00	7.296,25	KG		Qualitätskontrolle..	20
209012_203	203	13.02.2019 00:00:00		14.02.2019 00:00:00	7.300,00	0,00	KG		Leerlauf	20
209025_93	93	06.02.2019 00:00:00	01.02.2019 10:10:49	06.02.2019 00:00:00	4.000,00	0,00	KG		An PLS gesendet	33_10
▼ Maschinengruppe: 2W										
208598_22	22	10.12.2018 00:00:00	05.12.2018 13:31:15	10.12.2018 00:00:00	9.722,00	19.436,16	KG		Qualitätskontrolle..	32_2
208627_90	22	13.12.2018 00:00:00	07.12.2018 07:56:53	13.12.2018 00:00:00	9.722,00	19.440,79	KG		Qualitätskontrolle..	32_2
20856242_22	90	06.12.2018 00:00:00	03.12.2018 14:13:38	06.12.2018 00:00:00	7.143,00	13.554,05	KG		Qualitätskontrolle..	25
20856386_22	22	14.12.2018 00:00:00	11.12.2018 07:30:52	14.12.2018 00:00:00	9.722,00	19.454,12	KG		Qualitätskontrolle..	32_2
208582_32	32	14.02.2019 00:00:00		14.02.2019 00:00:00	9.722,00	0,00	KG		Leerlauf	32
209086_46	49	11.02.2019 00:00:00	06.02.2019 13:44:40	13.02.2019 00:00:00	4.000,00	0,00	KG		Pickliste generiert	49
209151_44	44	13.02.2019 00:00:00		14.02.2019 00:00:00	5.000,00	0,00	KG		Leerlauf	48
209526_25	25	08.02.2019 00:00:00	05.02.2019 14:21:22	08.02.2019 00:00:00	7.143,00	0,00	KG		Pickliste generiert	25
209549_5210	52010	12.02.2019 00:00:00		13.02.2019 00:00:00	4.000,00	0,00	KG		Leerlauf	50
▼ Maschinengruppe: 2Y										
209042_51	51	12.02.2019 00:00:00		14.02.2019 00:00:00	1.457,00	0,00	KG		Leerlauf	83_1
209538_83	83	14.02.2019 00:00:00		19.02.2019 00:00:00	2.000,00	0,00	KG		Leerlauf	83
▼ Auftragsstyp: Abfallauftrag										
▼ Maschinengruppe: A3										

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## Orders – individually adapted

- **Individual adaption of order parts**
  - Changes in line and sequence within given rules
- **Batch handling**
  - Production instructions and references
  - Change source and target
  - Change material and amount
- Dependant on user rights

Reihenfolge ändern

Charge	Reihenfolge	Chargenstatus	Qualität
18_94	1	Geplant	V1
18_26	0	Behandeln	VS4
18_175	0	Geplant	VS4
18_92	0	Geplant	V1
18_29	0	Geplant	V1
18_60	0	Geplant	V1






Auftrag bearbeiten

Auftragsklassifizierung: Schmelzen  
 Charge: 18\_58  
 Qualität: VS4 (VS4)  
 Anlage: Ofen 2  
 Rezeptur: #Kein Rezept vorhanden

Parameter	Wert	Einheit
Produktionshinweis	-	
Produktionsanweisung	-	
Ofen	O2	
Anlage	S1	



# Recipes

- **Master recipe**
  - Provided by ERP system
  - Stored constantly in the system
- **Actual recipe**
  - Only for the actual order
  - Can be adapted
  - Verification if all relevant data is given right (Status, material available etc.)

10624\_435

<Stammrezept>

(ohne Auftrag)

123456 (Status: 0)

20535 (Status: 0)

20536\_202 (Status: 3)

20537\_438 (Status: 4)

20693\_438 (Status: 4)

20693\_10 (Status: 4)

20602\_438\_1 (Status: 5)

20693\_438\_4\_30 (Status: 5)

20602\_438\_2 (Status: 5)

10924\_1\_448 (Status: 4)

20615\_0\_922 (BA Status: 3)

20614\_0\_922 (BA Status: 3)

**All data can be taken over to the basic recipe or used temporary**

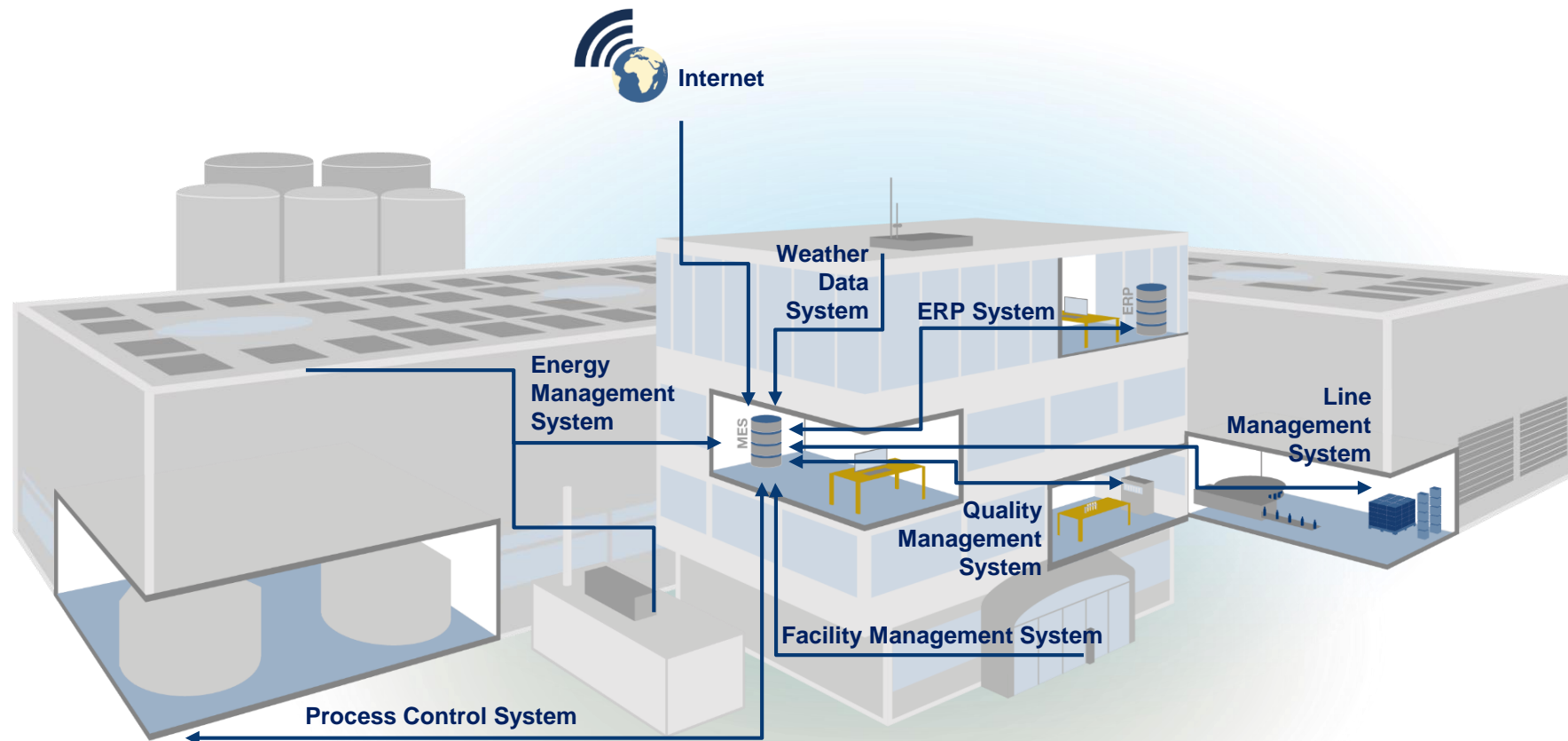
Stül-Pos.	Rohwa...	Bezeichnung Rohware	Grundoperation	Dosierweg	Tankweg	Menge [%]	Menge [kg]	Volumen [l]	kum. Volumen [l]	Dichte [kg/l]	Nachspülen	Molchl. n. ausschieben	Zwangdosierung	Zeit	Mischer	Pumpe	Conti-TDS
10	205	484	Dosierung	Kommissioniertes Ge...	Gatherkupplung	5000	9500	685	9020	1,03	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
15	818	35	Dosierung	Kommissioniertes Ge...	Gatherkupplung	2	0,05	0,02	9610	1,00	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
11		Dispergieren [min] [m...	Info				2,0000	0,0000		0,0000	<input type="checkbox"/>	<input type="checkbox"/>					
20	202	Titandioxid	Dosierung	Kommissioniertes Ge...	Gatherkupplung	9100	90	1040	9130	2,10	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
30	911	Mattierung 1	Dosierung	Kommissioniertes Ge...	Gatherkupplung	600	0,006	6000	89310	1,00	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
40	42	FLOW 6	Dosierung	Kommissioniertes Ge...	Gatherkupplung	700	0,70	179	1430	1,97	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
42	30	WASSER	Dosierung	Prozessleitung Wass...	<Kein Wert>	400	35	0,34	10432	1,00	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
43	202	Verdicker	Dosierung	Kommissioniertes Ge...	Gatherkupplung	0,50	750	77	11132	1,00	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
44	897	Mix	Dosierung	Kommissioniertes Ge...	Gatherkupplung	0,02	0,1	0,033	5132	1,63	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
45	891	Mix Schw.	Dosierung	Kommissioniertes Ge...	Gatherkupplung	1	0	0	2135	1,16	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
46	999	Mix Grün	Dosierung	Kommissioniertes Ge...	Gatherkupplung	0	90	0,1	2485	1,26	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				
50	928	Lösung	Dosierung	Kommissioniertes Ge...	Gatherkupplung	0,03	50	0,3	1565	1,00	<input type="checkbox"/>	<input type="checkbox"/>	Keine Zwangdosierung				

## Actual situation – Pain Points

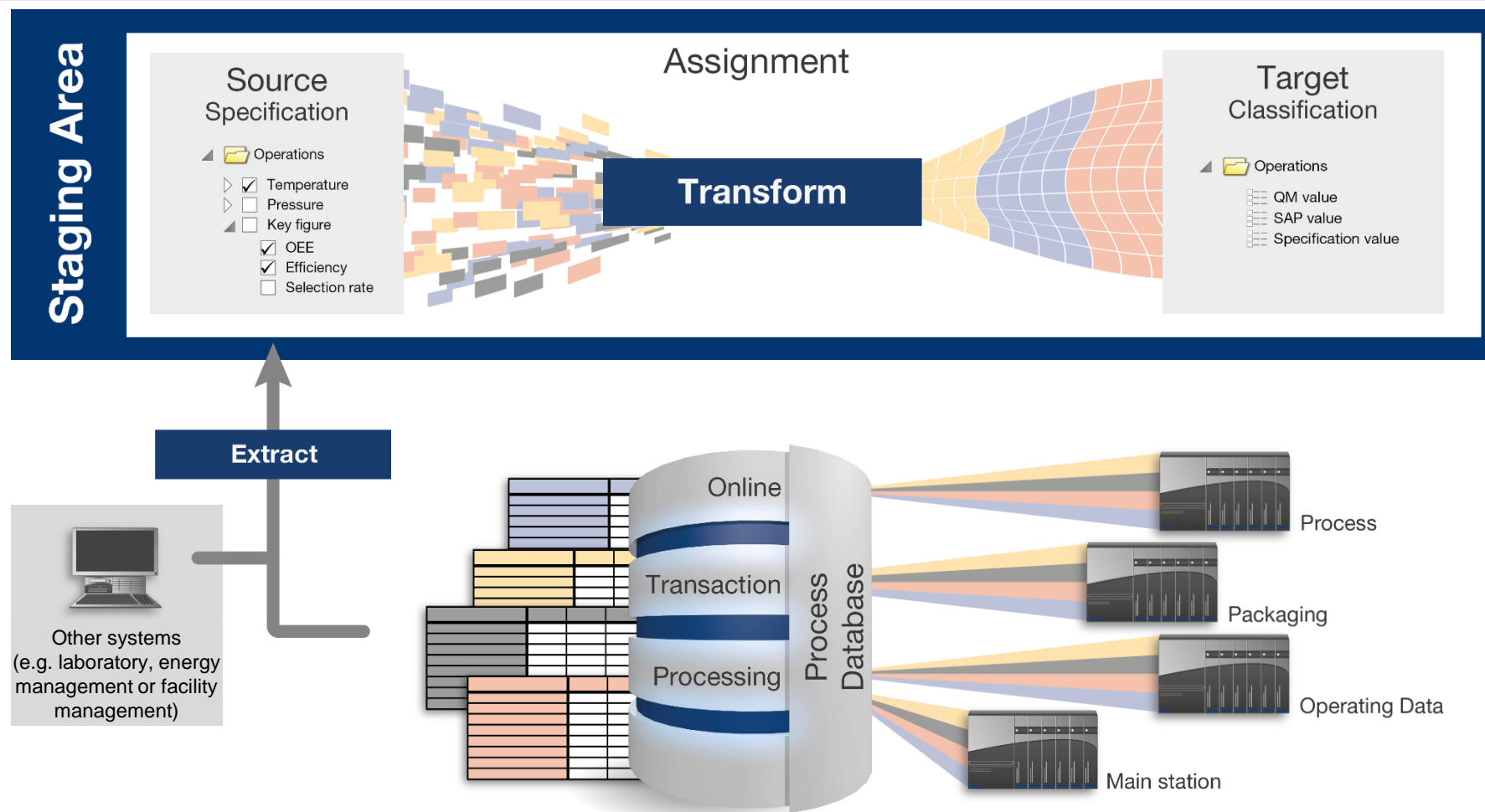
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# Industry 4.0

## MES: The relevant information for Smart Manufacturing

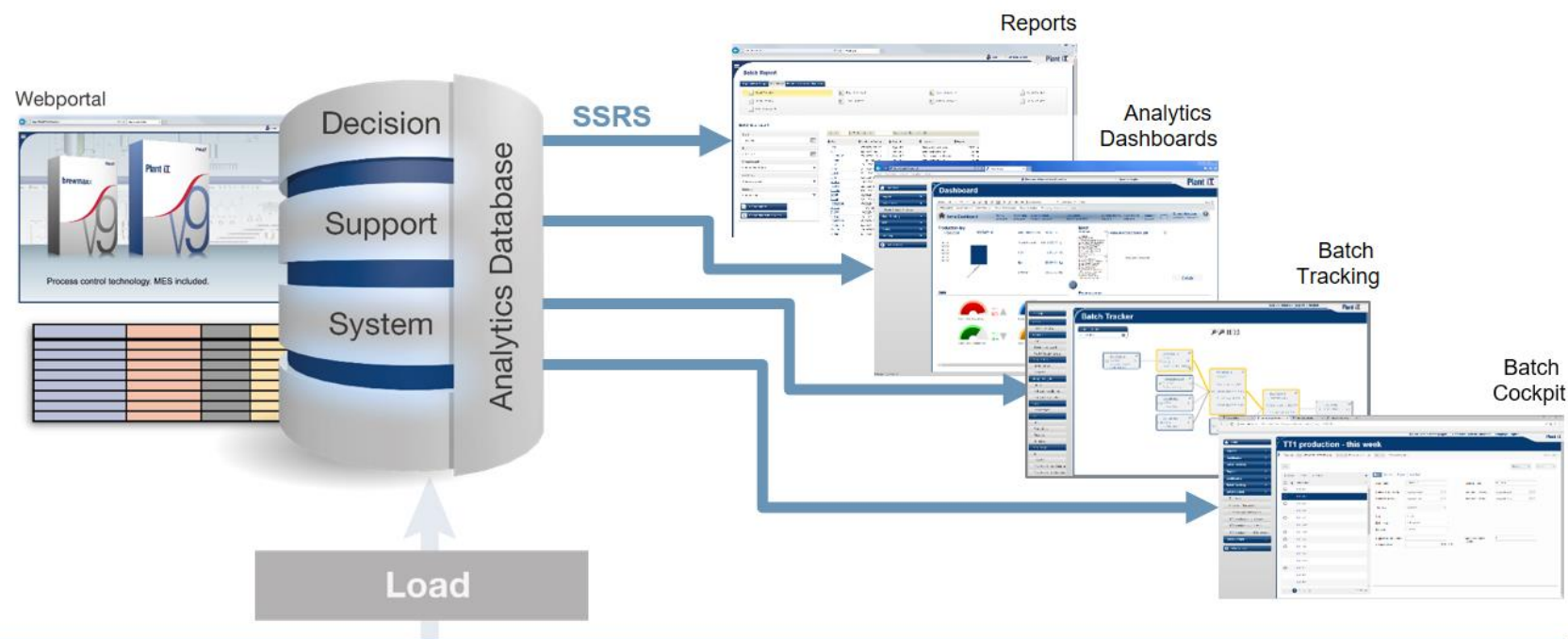


# Information flow model I



# Plant Integrate iT

## Information flow model II



### Staging Area

#### Source Specification

- Operations
  - ☒ Temperature
  - ☐ Pressure
  - ☐ Key figure
    - ☒ OEE
    - ☒ Efficiency
    - ☐ Selection rate

#### Assignment

Transform

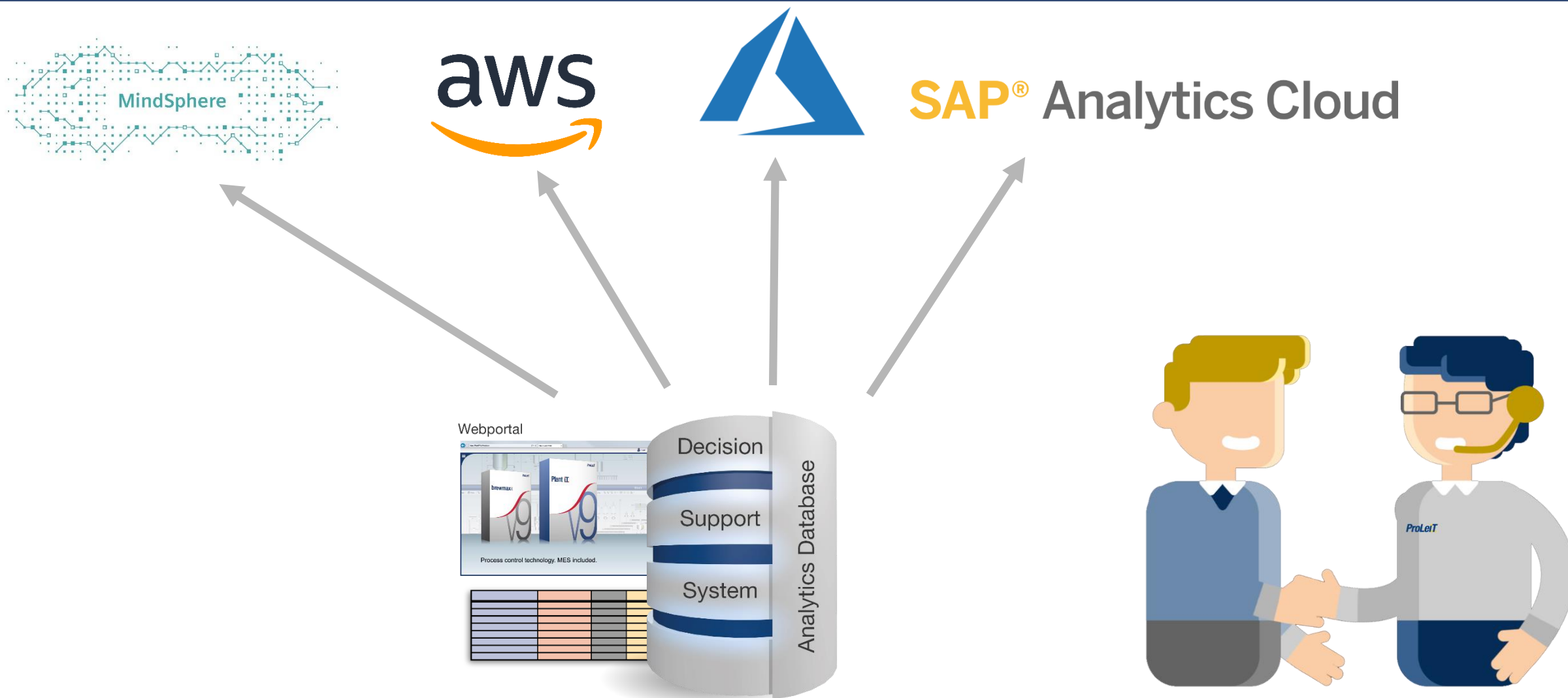
#### Target Classification

- Operations
  - QM value
  - SAP value
  - Specification value



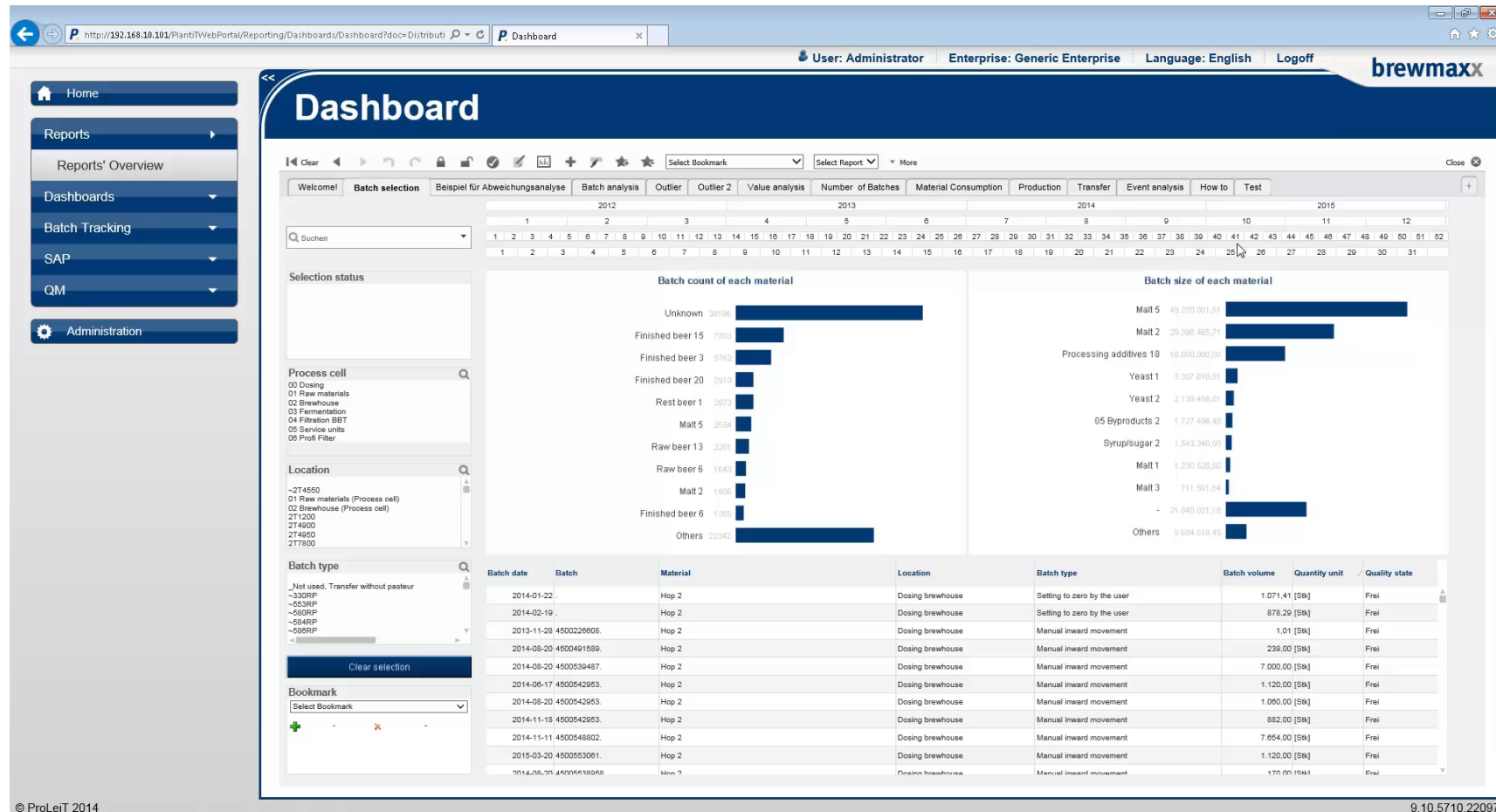
# Implementation Industry 4.0 and Big Data

## Information flow model III



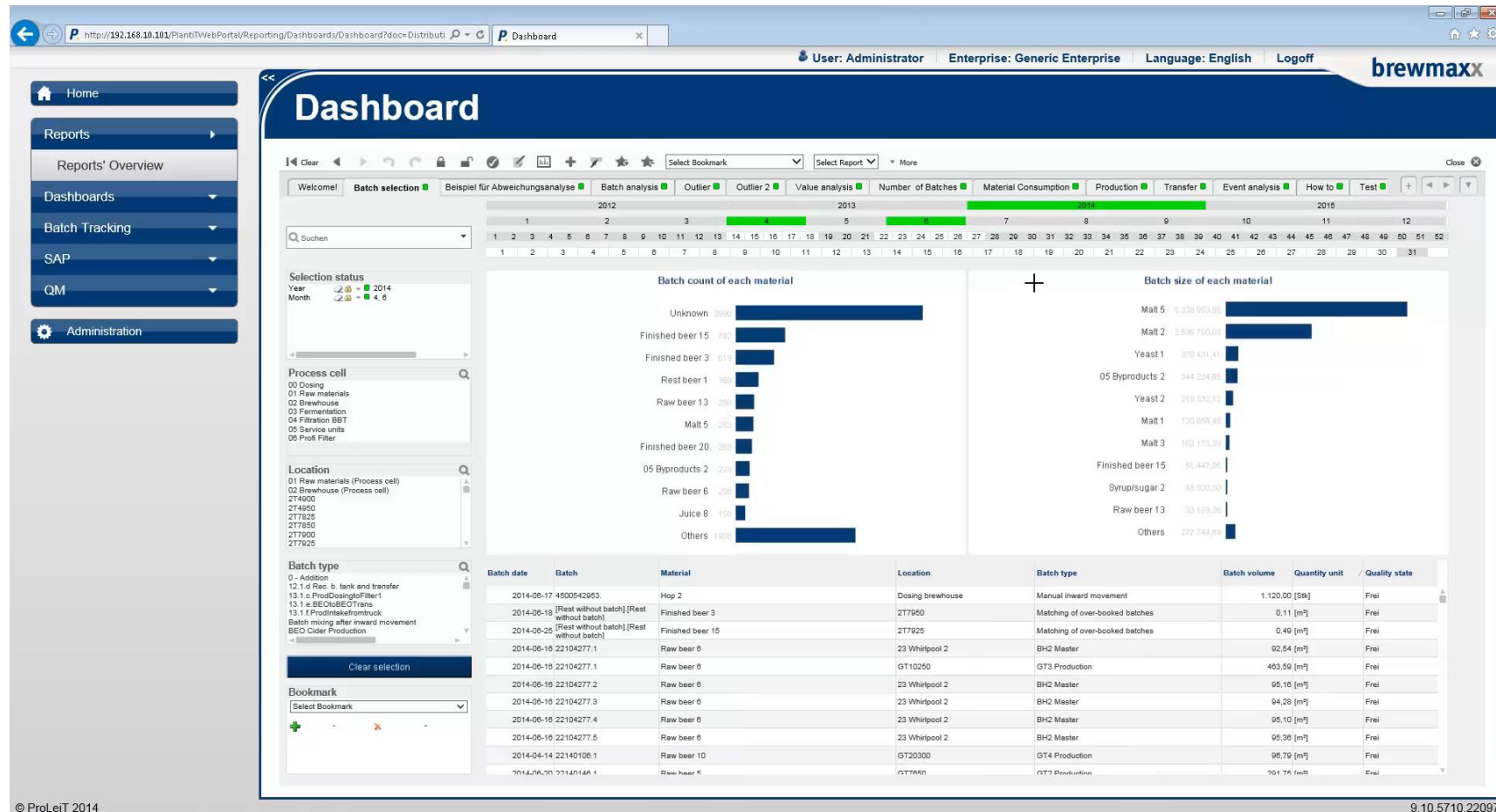
# Batch selection

## Example: Analytics dashboard



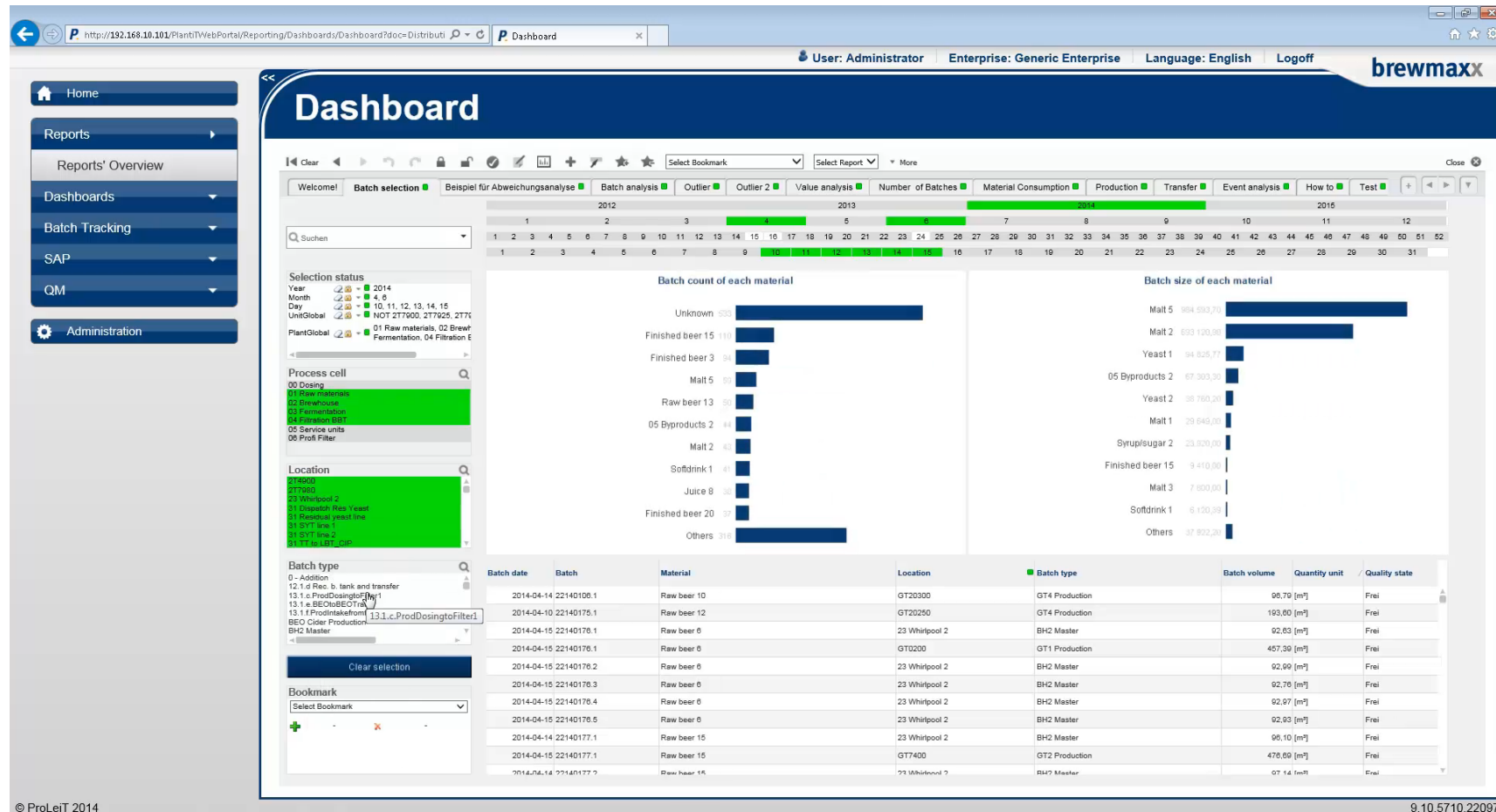
# Batch selection

## Example: Analytics dashboard



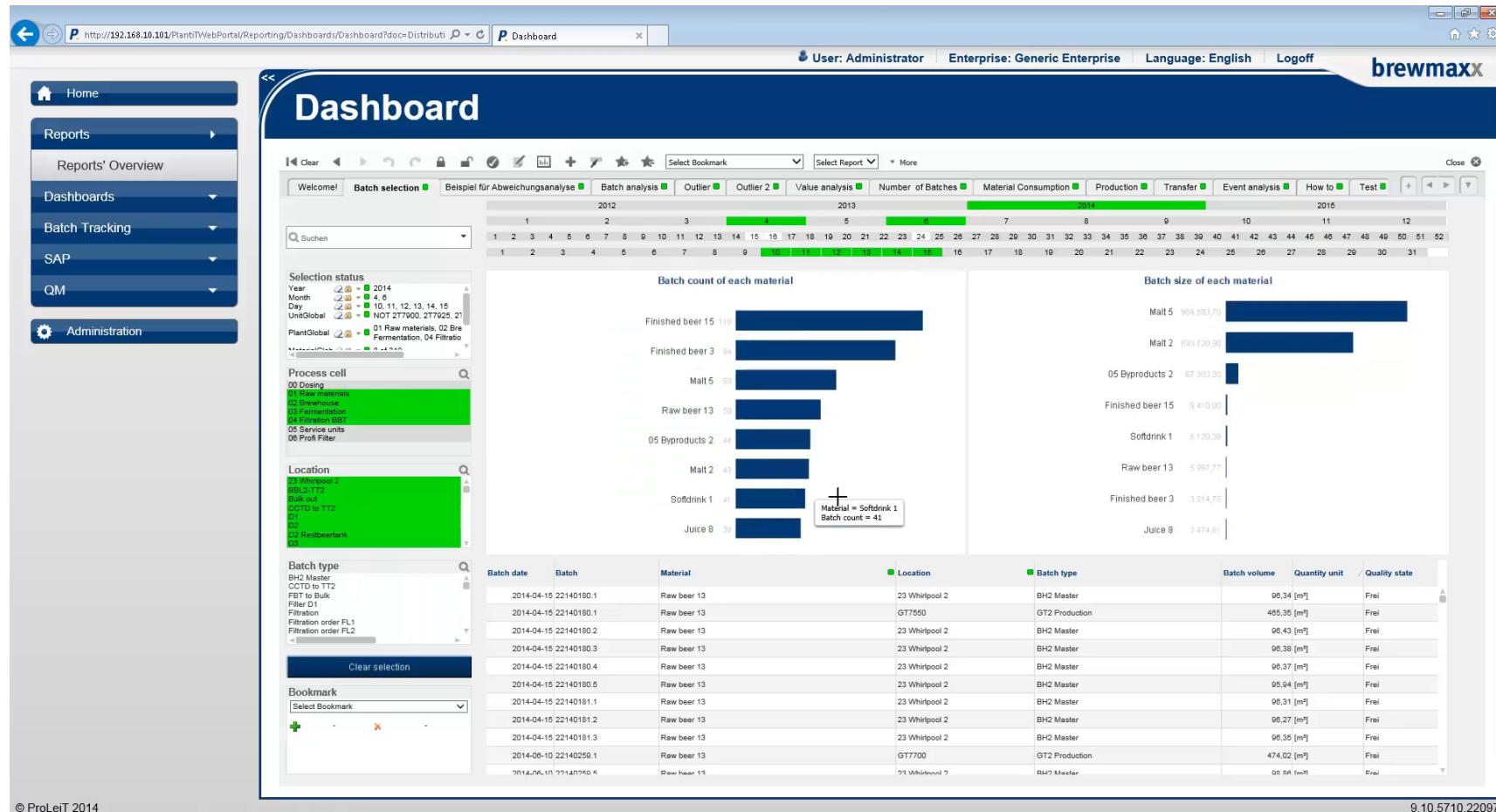
# Batch selection

## Example: Analytics dashboard



# Batch selection

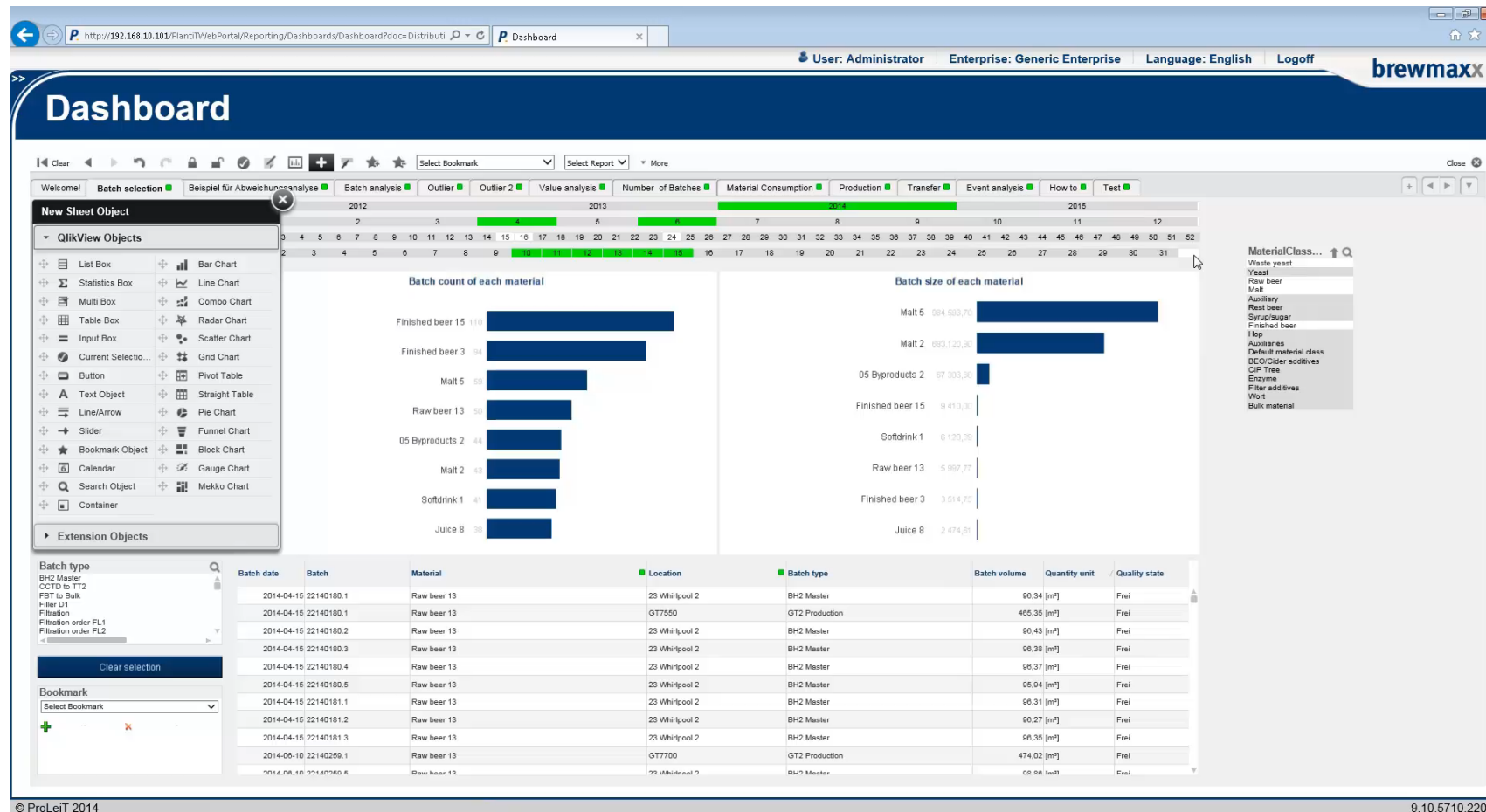
## Example: Analytics dashboard





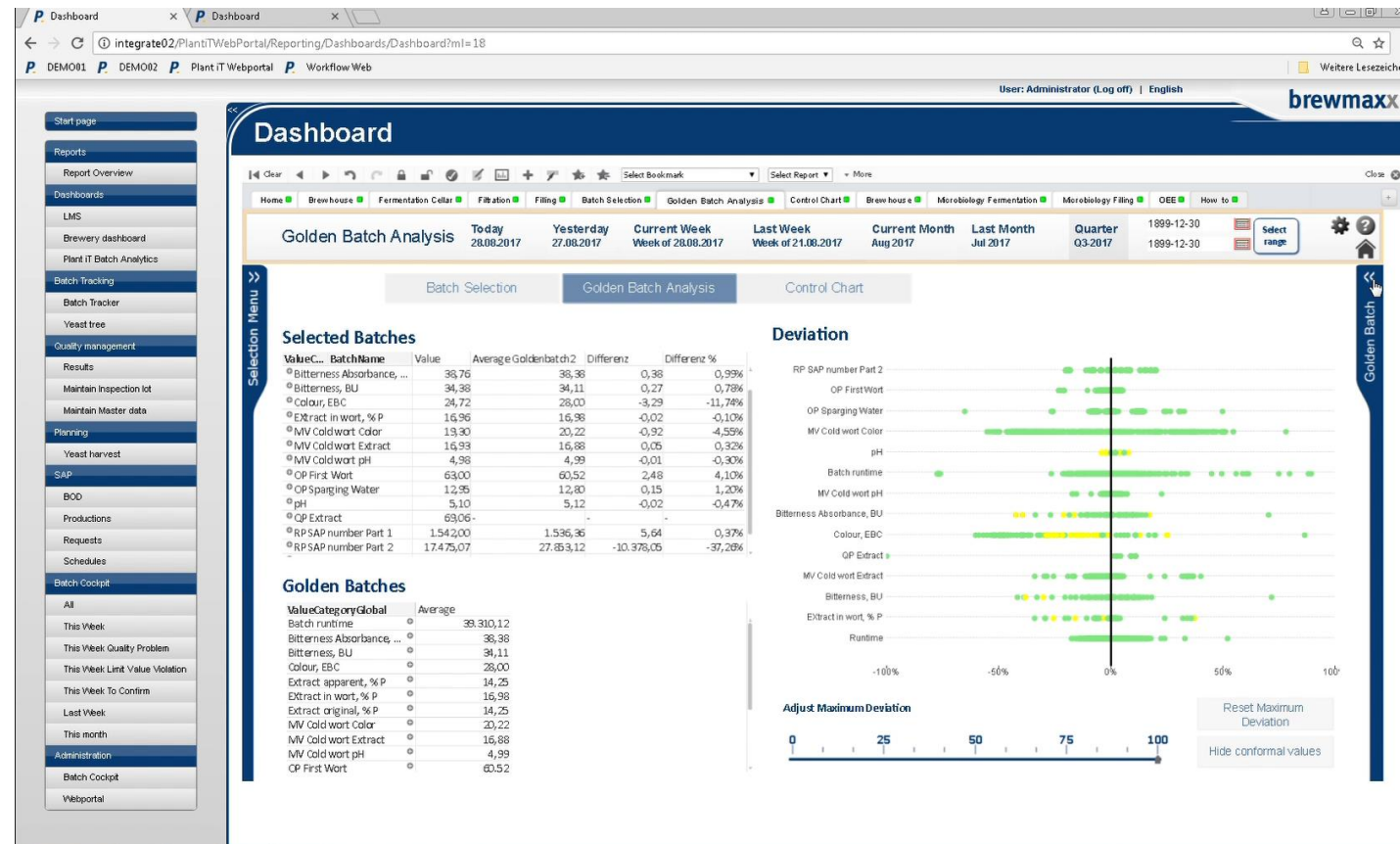
# Batch selection

## Example: Analytics dashboard



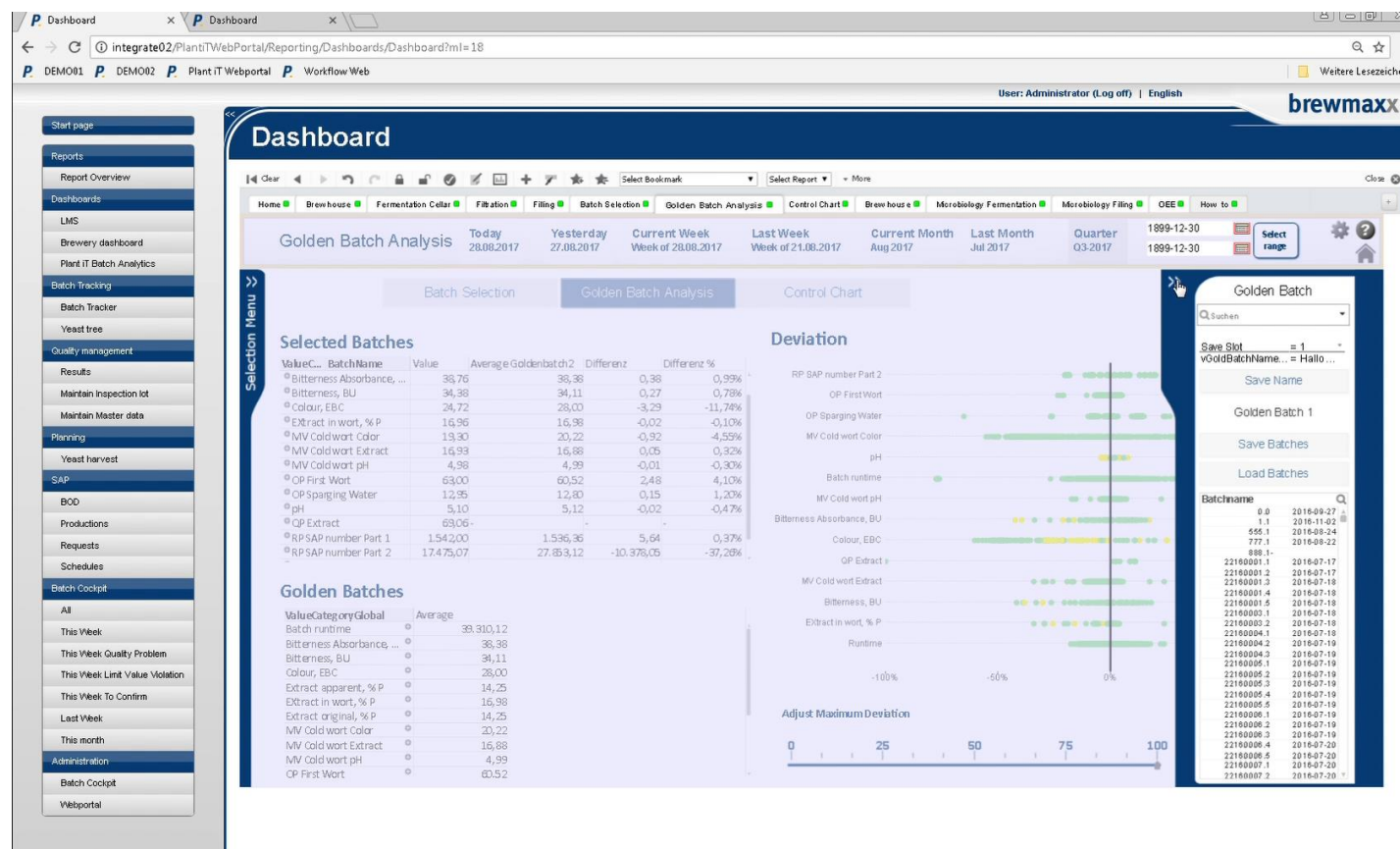
# Example Big Data Analysis

## Golden Batch Analysis



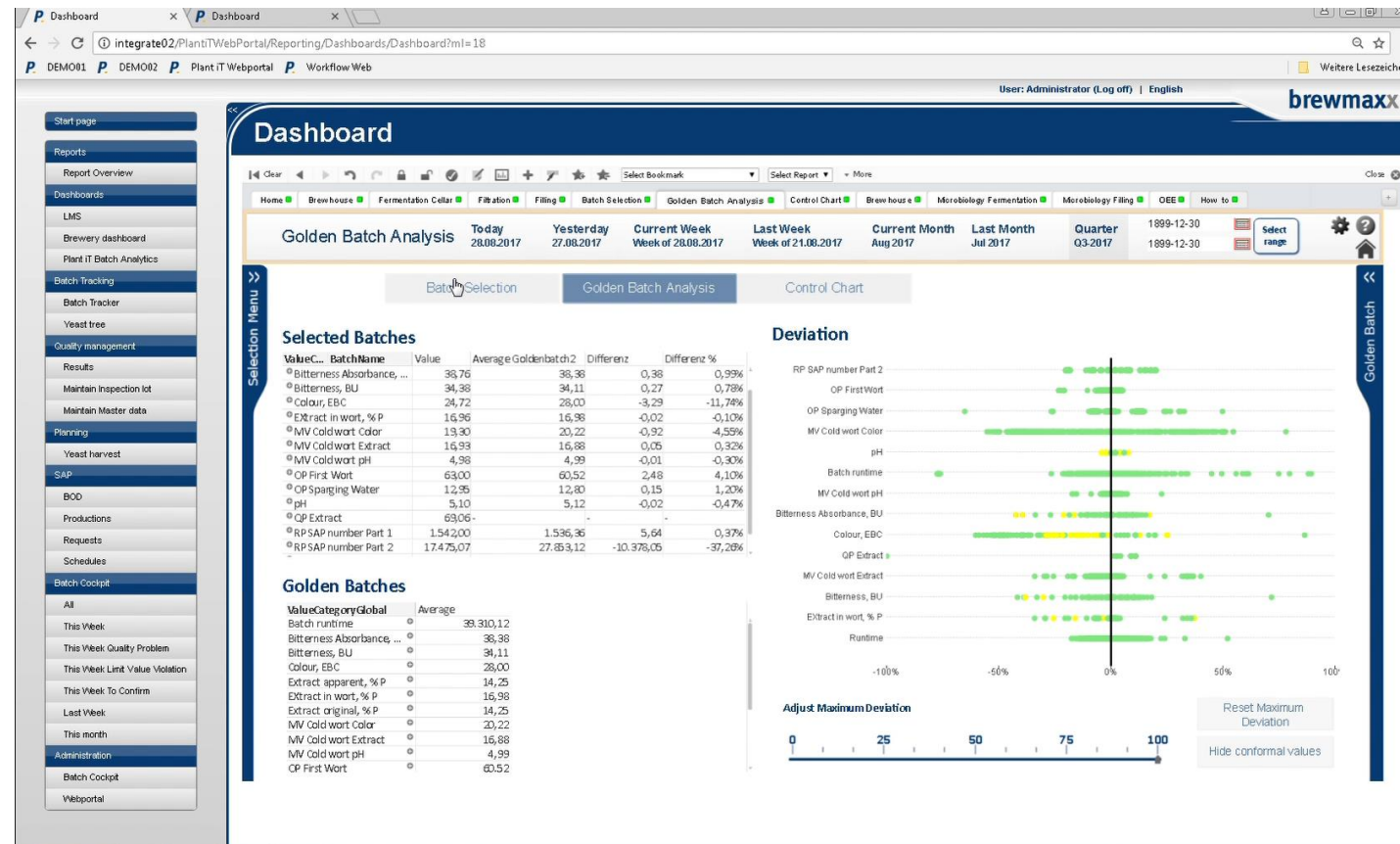
# Example Big Data Analysis

## Golden Batch Analysis



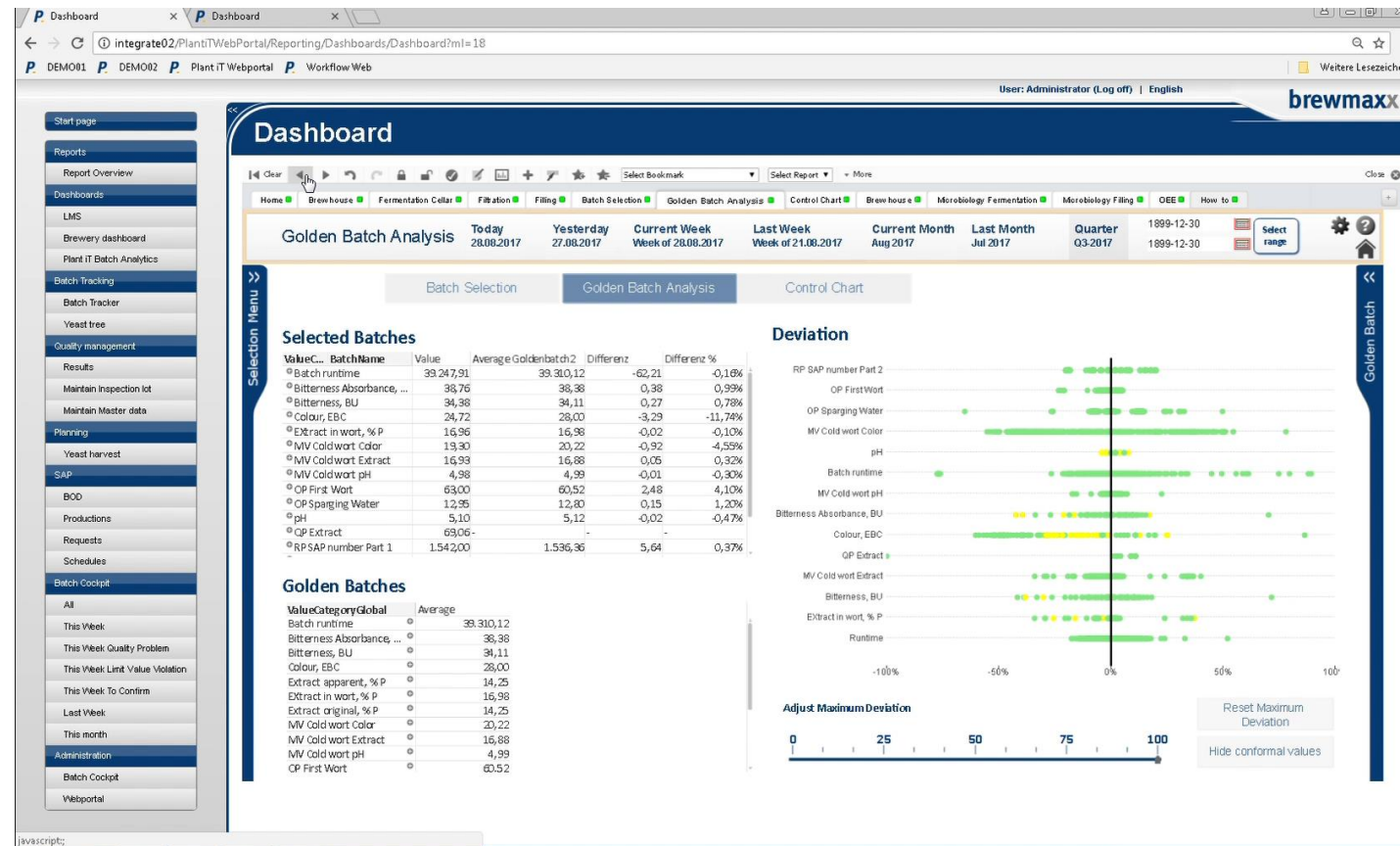
# Example Big Data Analysis

## Golden Batch Analysis

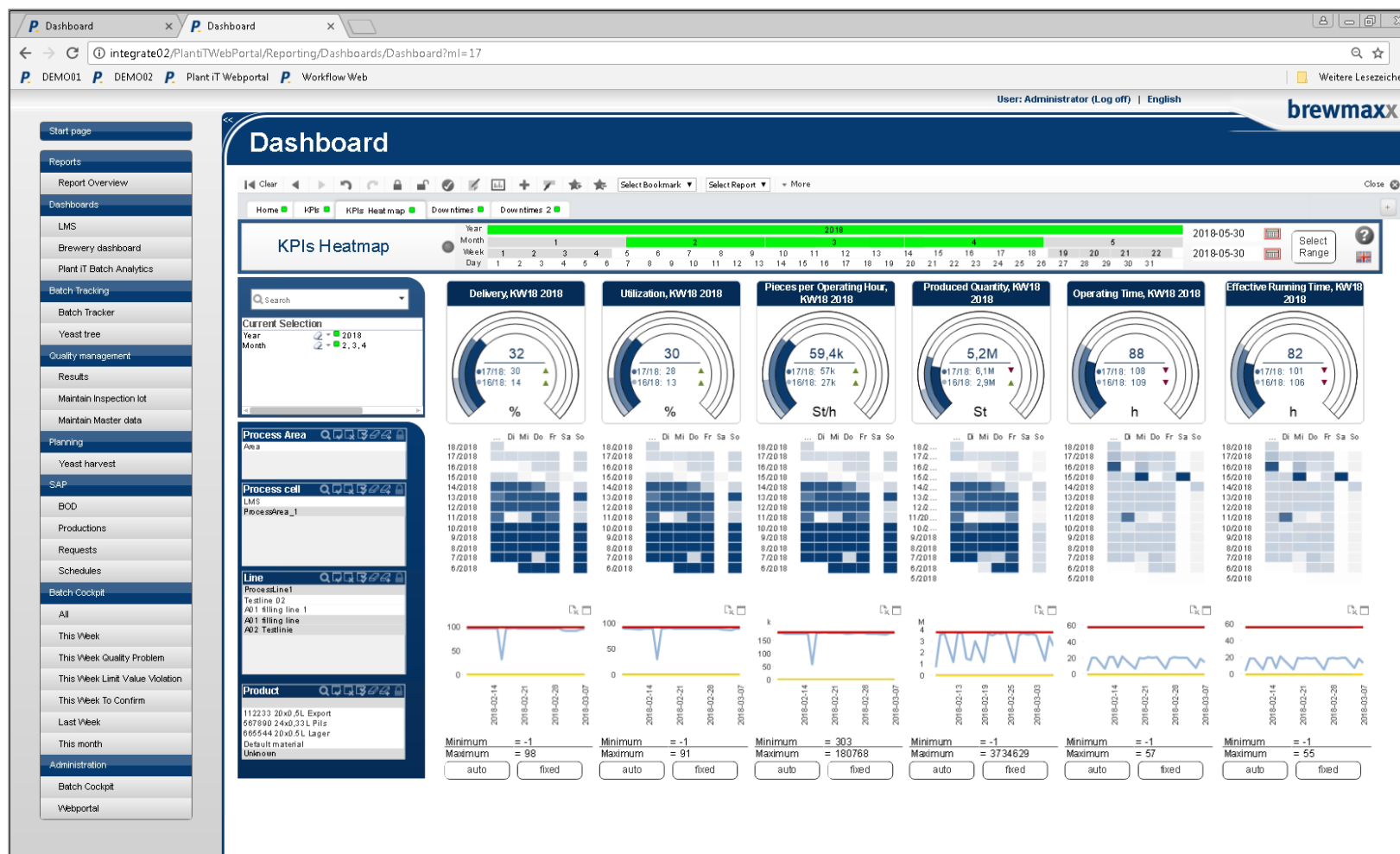


# Example Big Data Analysis

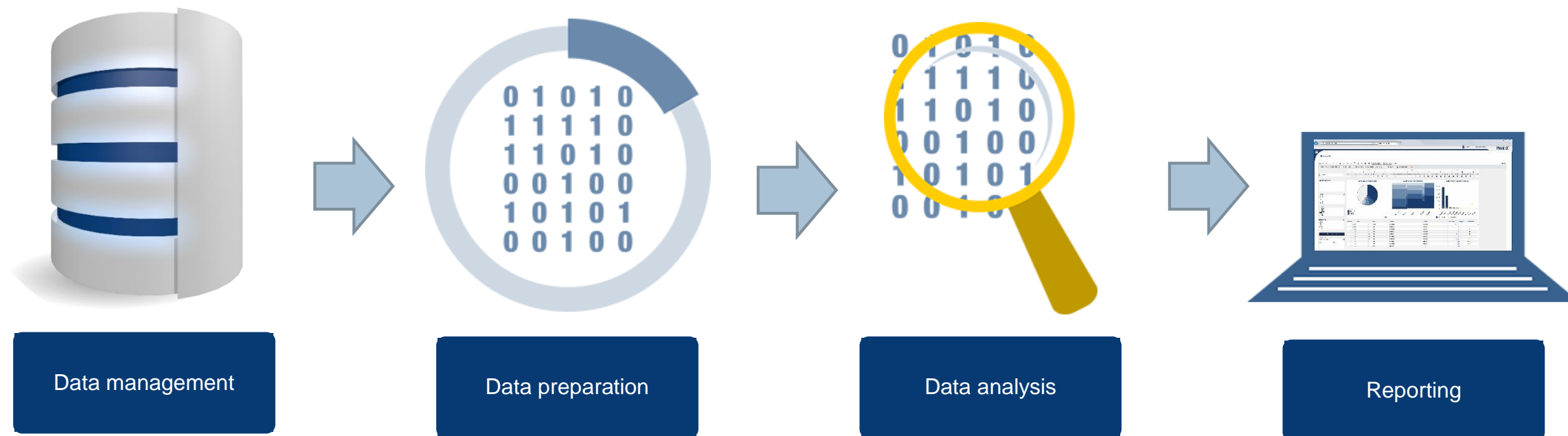
## Golden Batch Analysis







## Data value-added chain





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## Benefits from MES Control Centre

Performance  
Increase



Increased  
Quality



Extended  
Availability



Optimised  
Services



Benefits

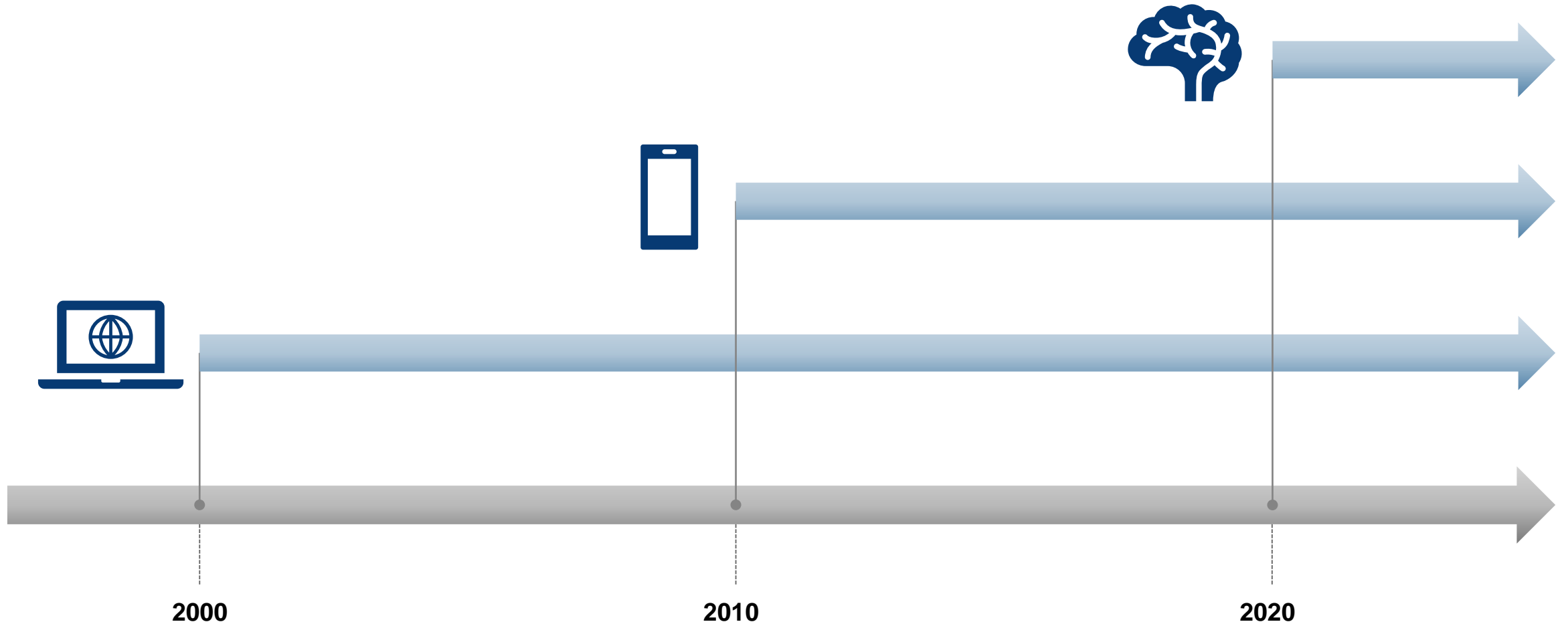
# Outlook

## Augmented Reality



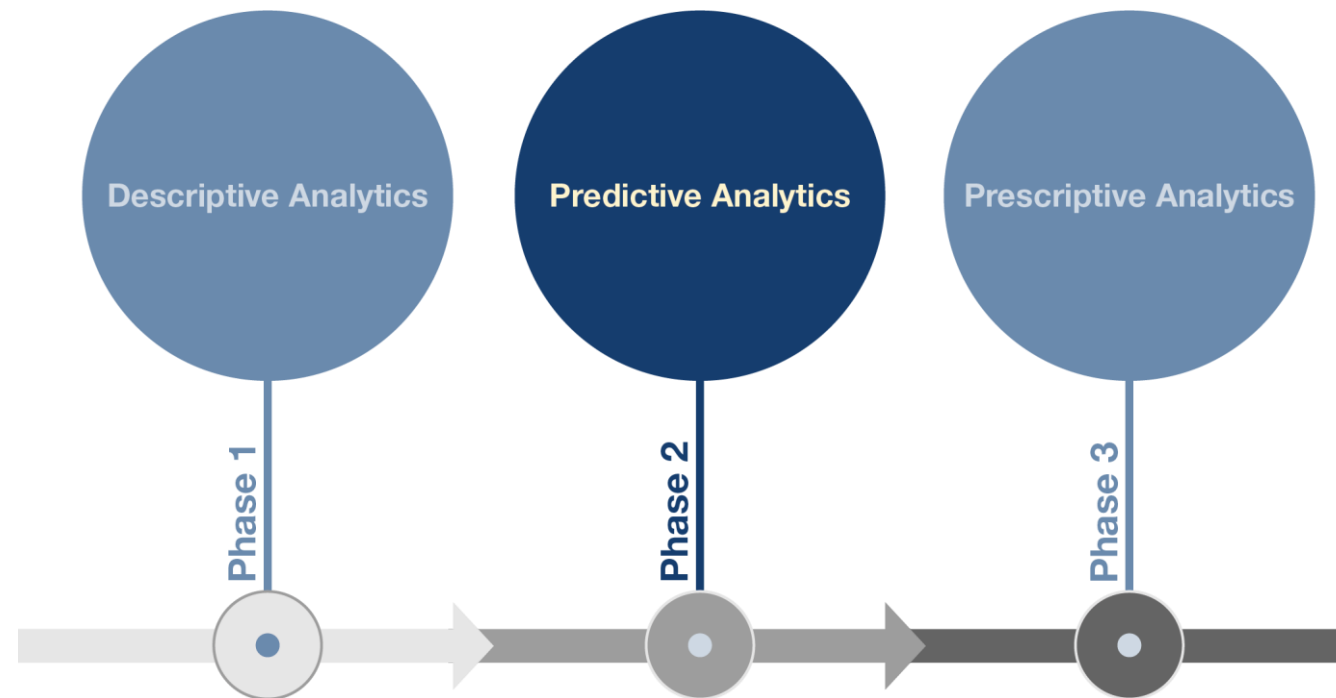
# Outlook

## Game Changer



# Outlook

## Future Analysis



## Kontakt

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Kiew/UA – Monterrey/MX –  
Moskau/RU – Piracicaba/BR –  
Sevilla/ES – Shanghai/CN –  
Sofia/BG – Wien/AT

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