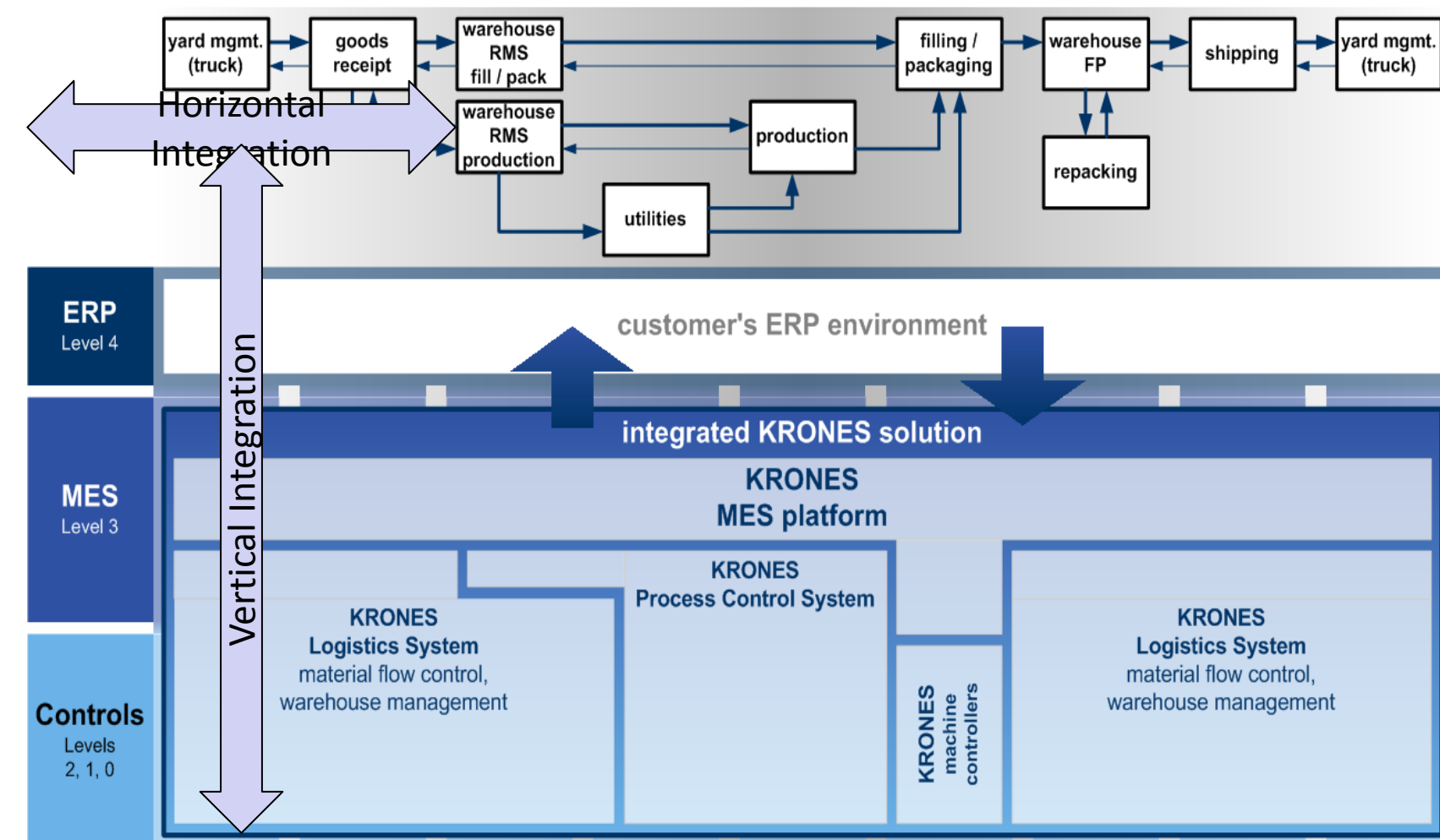


Abstract

Full traceability of all ingredients backwards from a pallet's SSCC number down to the delivery of malt and detailed QA info on e.g. the malt-intake and vice-versa is an increasing request for breweries of almost all sizes in each part of the world. This example is to show how an integrated MES-solution for the entire brewery can help to solve these questions about tracking and tracing. But not only T&T, also providing consumption-data, executing material-bookings and transferring performance data paperless from a controls-level to the ERP-level is a major cornerstone of implementations like this.

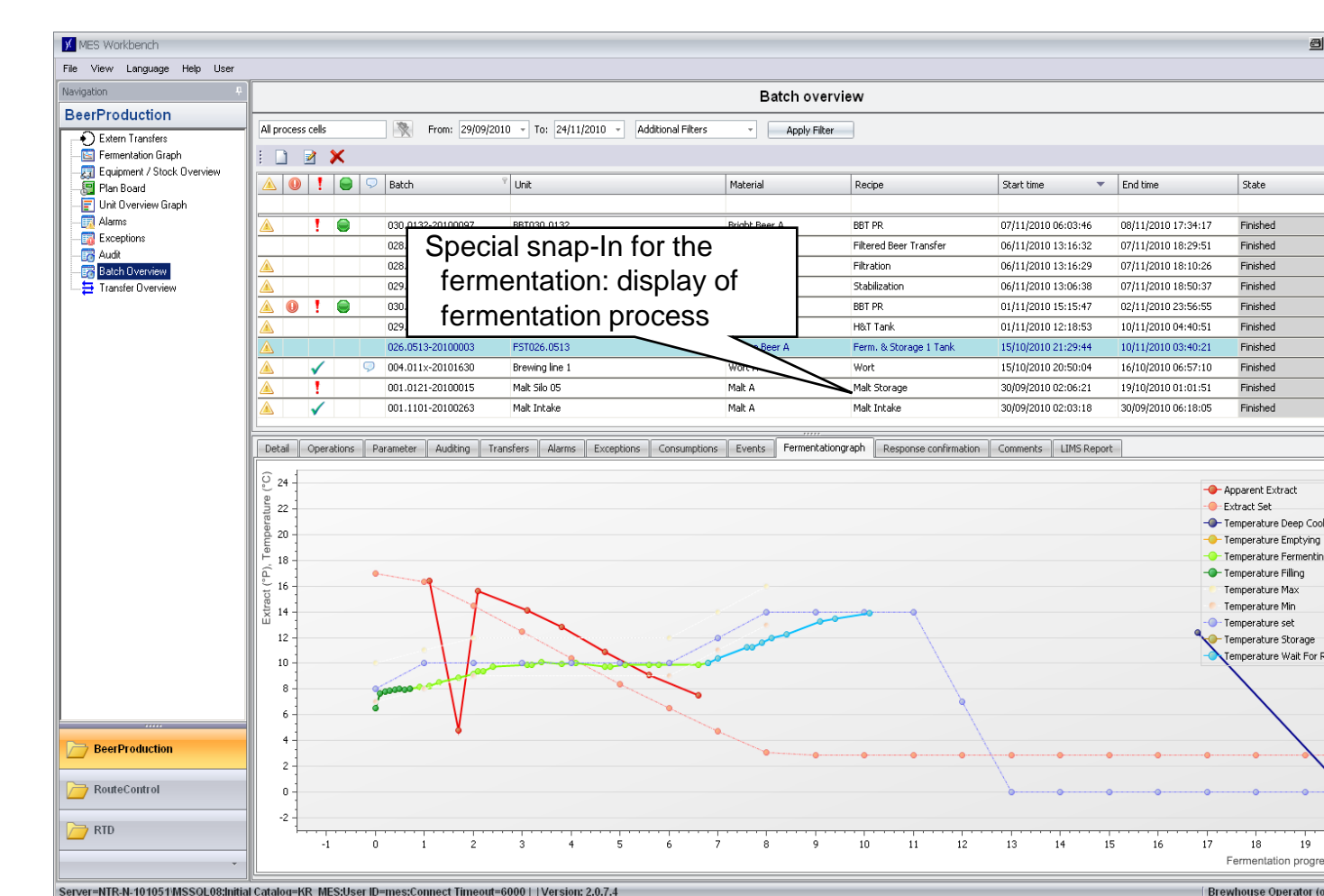
Level of integration



MES Beer Production - Workbench

The screenshot shows the MES Beer Production Workbench interface. Key features include: Selection of the Module, Selection of different areas, Window with main view (Batch Summary), and Snap-ins with additional functions. The interface displays a list of batches with columns for Name, Material, Recipe, Start time, End time, and State.

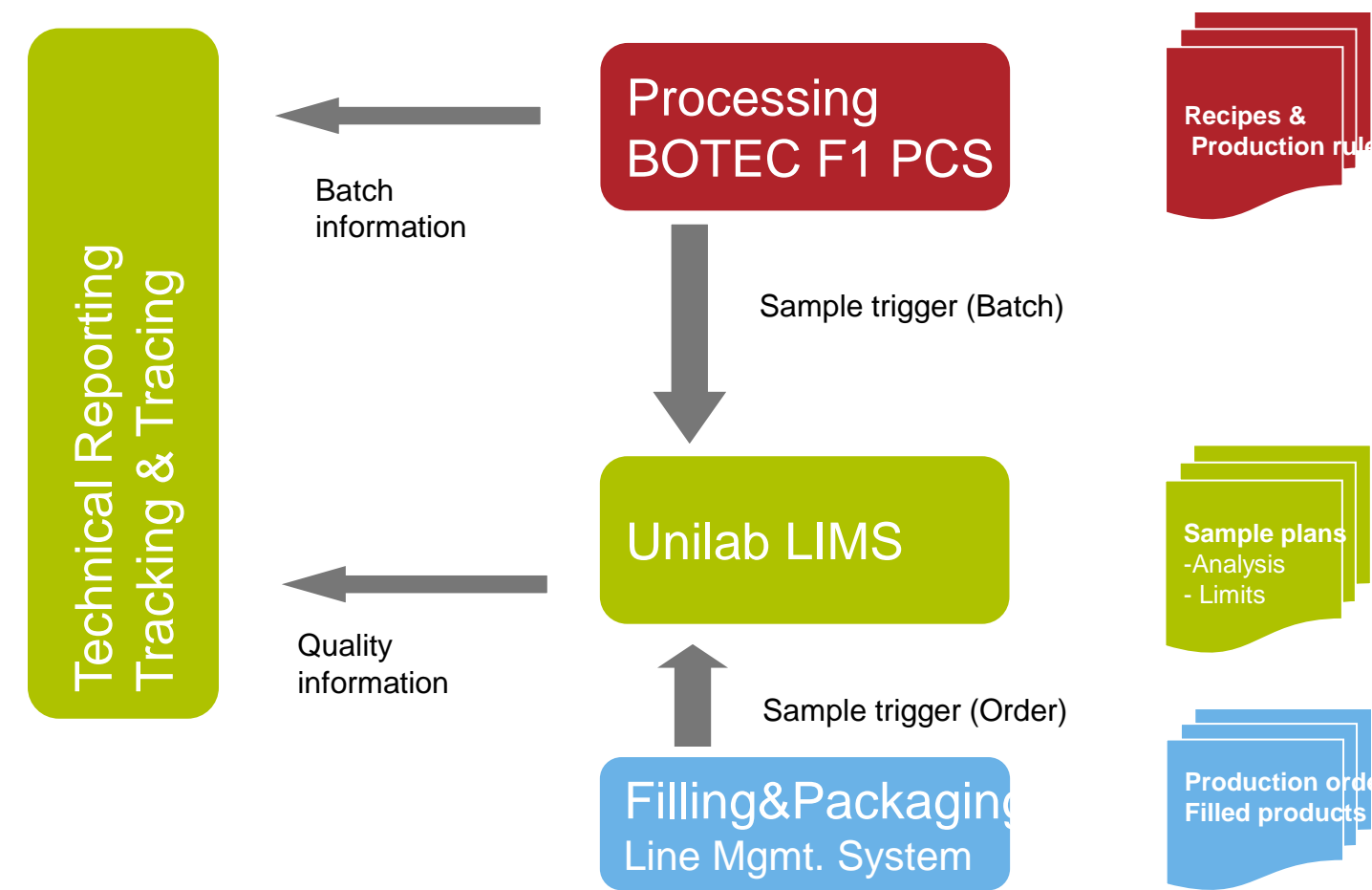
Fermentation graph at one glance



Easy access via Web-Reports

The screenshot shows a web-report for a Batch Step Protocol. It includes a table with columns for Step, Unit Procedure, Name, Production, Start, End, Duration, and Status. The report provides detailed information about the production process, including material and equipment data.

Integrated areas and functionalities



Information coming from different areas throughout the brewery needs to be consolidated in one central reporting tool, which also provides the GUI for backwards and forward Track & Trace. This solutions includes all major Software Modules within the Production and Filling-Area. Integration of Laboratory information is crucial to get a comprehensive view on the production runs.

Data-Acquisition is the baseline

The diagram shows 'Data Acquisition for Primary Production' with a flow from yard mgmt (truck) to goods receipt, RAS Storage, Primary production, filling/packaging, warehouse FP, shipping, and yard mgmt (truck). Below the diagram is a list of data points for 'Krones Data Acquisition':

- Alarms, Messages, Hints
- Counters
- Equipment Modes and States
- Auditing
- Order List, including
 - Simple step protocol
 - Order detail report
- Process Parameters
- Material Movements
- Stock Levels
- Losses
- Exceptions
- Batch-/Order Data
 - Meta Data (Recipe, Start-/Endtime)
 - Course of Action (Partial procedures, operations, functions)
 - Batch parameters
 - Transfers (Start-/Endtime, Source, Target, Material, Amount)
 - LIMS-Integration (Triggering of sampling operations, Management of the quality level)

To enable seamless reporting and batch-documentation, data-acquisition is one of the key-elements of this MES solution. To avoid wrong inputs and manual interference, the primary goal is to have as much automatic data-gathering as possible. However, validation of data is key, as poor quality of data-input means poor reporting quality.

LIMS Integration

The screenshot shows the LIMS Integration in the MES interface. It displays a list of batches with columns for Name, Material, Recipe, Start time, End time, and State. The interface highlights the integration of LIMS data into the MES system.

MES Beer Production triggers LIMS activity based on batch confirmation coming from the PCS-level and receives quality information from LIMS to e.g. release tanks after successful samples.

Occupation and status of Units



MES Beer Production allows an comprehensive overview per batch of e.g. alarms and exceptions, fermentation-graphs, confirmations to ERP as well as an overview of each unit in terms of CIP stats and / or fill-level.



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