



Manufacturing Execution System and Laboratory Information Management System development

# **BRITISH AMERICAN TOBACCO**

## **Case Study**



# SOFT INDUSTRY ALLIANCE

## Industries



Manufacturing & Industrial Automation



Logistic & Supply Chain



Hospitality



Healthcare



Education, Entertainment & Media



Governmental

## Services



Software engineering & DevOps



Big Data & Analytics



Artificial Intelligence (AI)  
& Machine Learning (ML)



Internet of things (IoT)



Virtual Reality (VR), Augmented Reality (AR)  
& Mixed Reality (MR)



Cloud



Robotics



According to our 22 years of experience we have collected for you examples of our works. You could make sure we have relevant experience for solving your problem.

Continuous growth, development, and at the same time, stability and harmony – this is the concept of the infinity sign. Being placed on our logo, this symbol reflects the Soft Industry's business model: **full software development life cycle and focus on win-win long-term partnership.**



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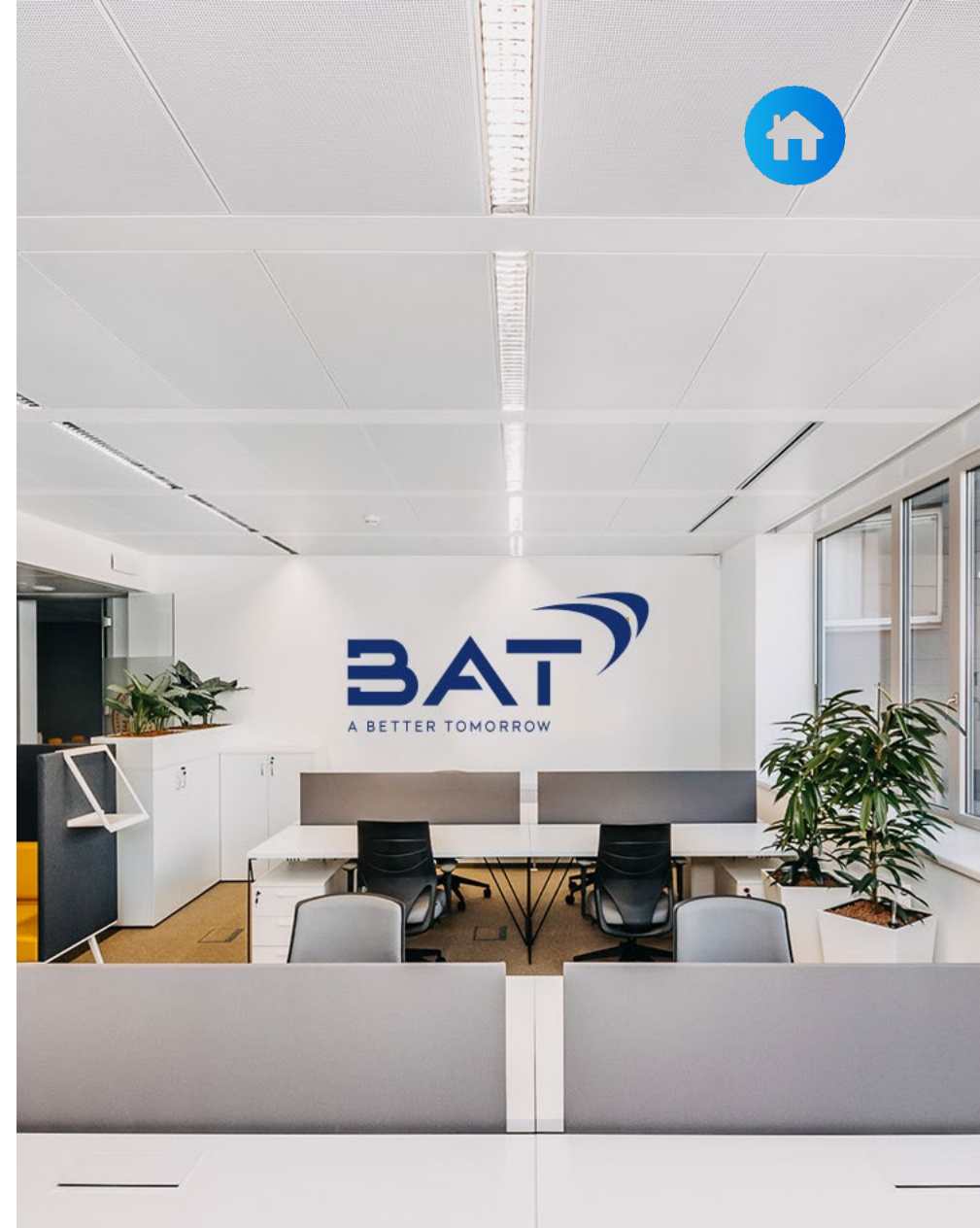
# ABOUT BRITISH AMERICAN TOBACCO

## British American Tobacco Group

BAT is a leading multi-category company operating in the consumer products segment, namely cigarettes, vaping products, tobacco heating products, modern oral products, including tobacco-free pads, and traditional oral products such as snus and snuff. Founded in 1902, the company employs more than 53,000 people worldwide and has factories in more than 40 countries.

## British American Tobacco Ukraine

British American Tobacco Ukraine is the first enterprise with foreign investments in the tobacco industry of Ukraine, which emerged in 1993 on the basis of the Pryluts'k tobacco factory. As a new modern high-tech enterprise, it exports products to Belarus, Armenia, Georgia, Moldova, Azerbaijan, Uzbekistan, Poland, Hungary, Romania, Croatia, and the Netherlands (for the Duty-Free network of the world's largest airports).



# PROJECT DESCRIPTION

MES and LIMS systems were created for the tobacco factory, which is part of the international company included in the Global TOP 3. The system is implemented and used at all stages of the production cycle, from the materials and ingredients feeding to the finished goods accounting and moving. An integration with the existing ERP WMS and SCADA systems, that allows to:

- Provide operational and analytical information to managers of different levels about the processes' status and efficiency
- Operate by production processes more efficiently using Lean manufacturing, 6-Sigma, and SPC methods
- Automate the data collection and processing with other systems integration and so to minimize the waste of time for data input, errors sick, and correction
- Have fast and full analytical reports with KPIs' monitoring, "bottlenecks" identifying and, based on trends, generate efficiency improvement plans



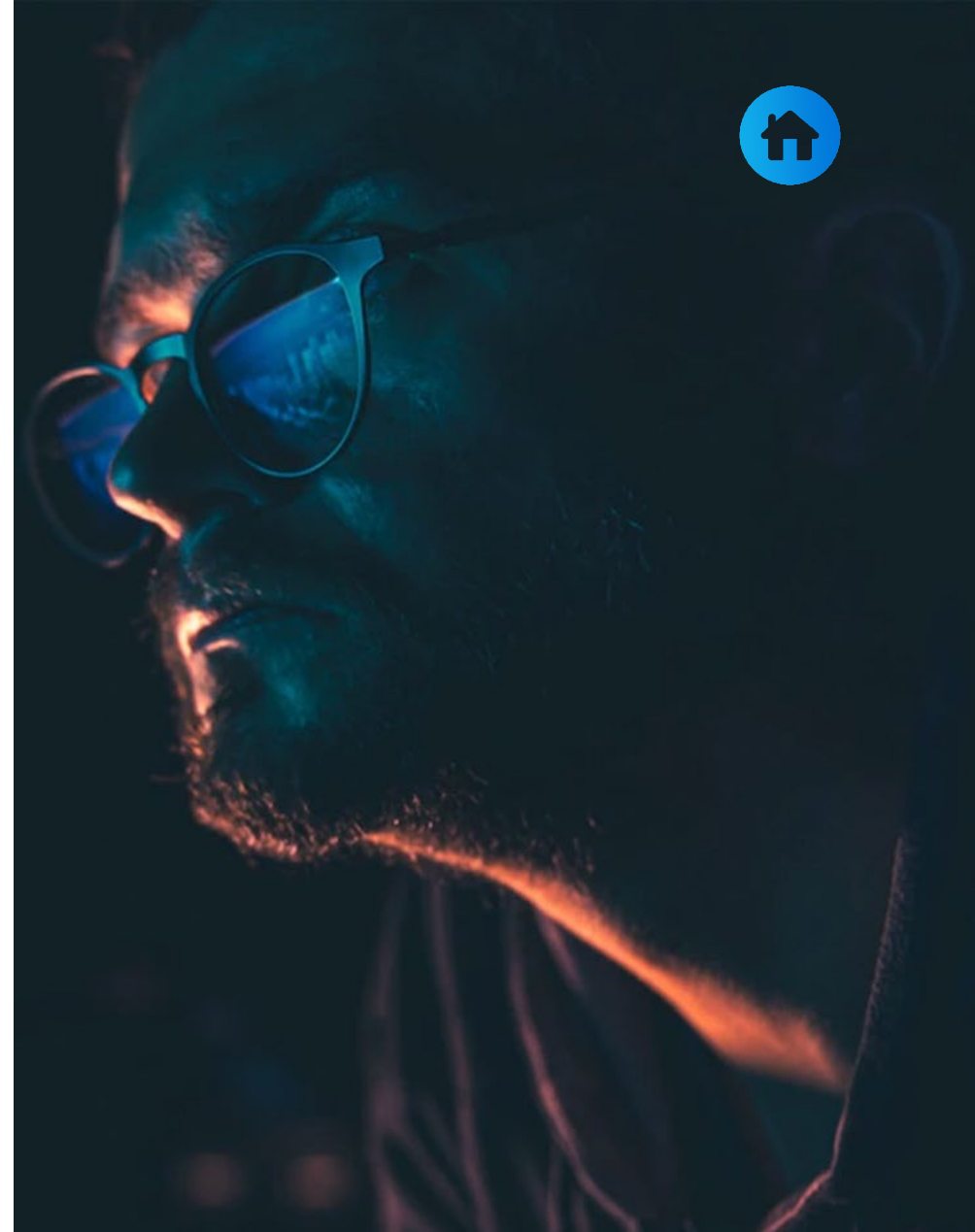
# BUSINESS CONTEXT

**Project timeline:** STRICT

**Selection process:** TENDER

In 2009, the general strategy of the company was to implement the highest standards of process performance and quality assurance in all factories around the world.

As a result, the management relied on increasing the level of automation in the processing and distribution of information in production, thereby increasing economic efficiency through instant KPI assessment and the rapid identification and elimination of negative factors.





# BUSINESS CONTEXT

Within specific indicators it means To:



Improve OEE (Overall Equipment Efficiency)



Increase Labor Productivity of the staff



Reduce Waste and Rejection



Increase the Quality of Finished Goods



Improve Forecasting Accuracy of the expected results



Increase Profitability through the Manufacturing Cost Reduction



# TECH CONTEXT

**Our task was to design and implement a unique system that unites the following main features:**

- data exchange with/between different systems (bridge/crossroads of information streams);
- several interconnected algorithms of complex calculations;
- working fast and fail-safe with maximum avoiding human faults factor;
- hierarchy users access rights according to the workplace and segregation of duties/powers;
- provide the ability to access the required information to employees where this access was limited due to financial reasons (like SAP account licenses).



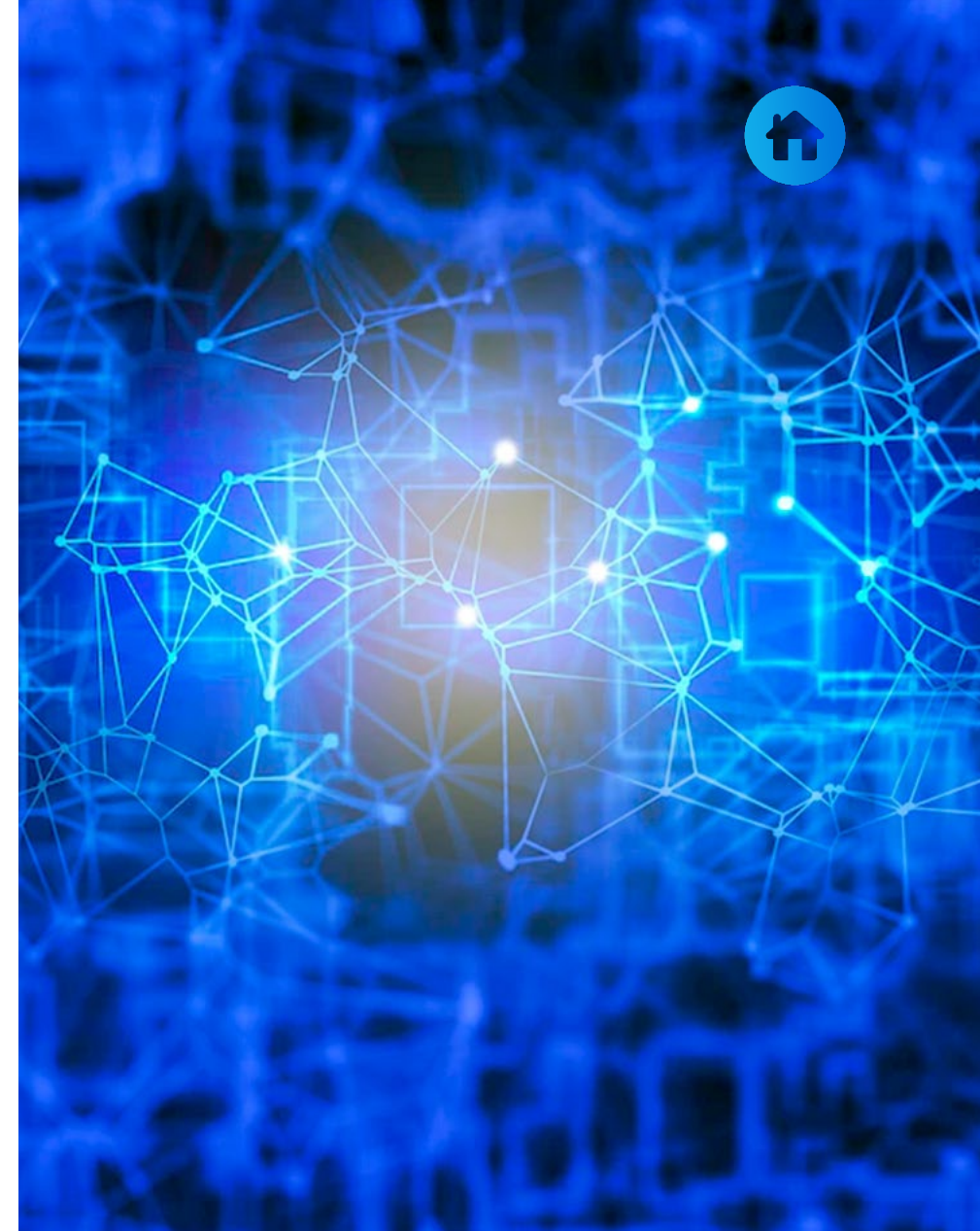


# TECH CONTEXT

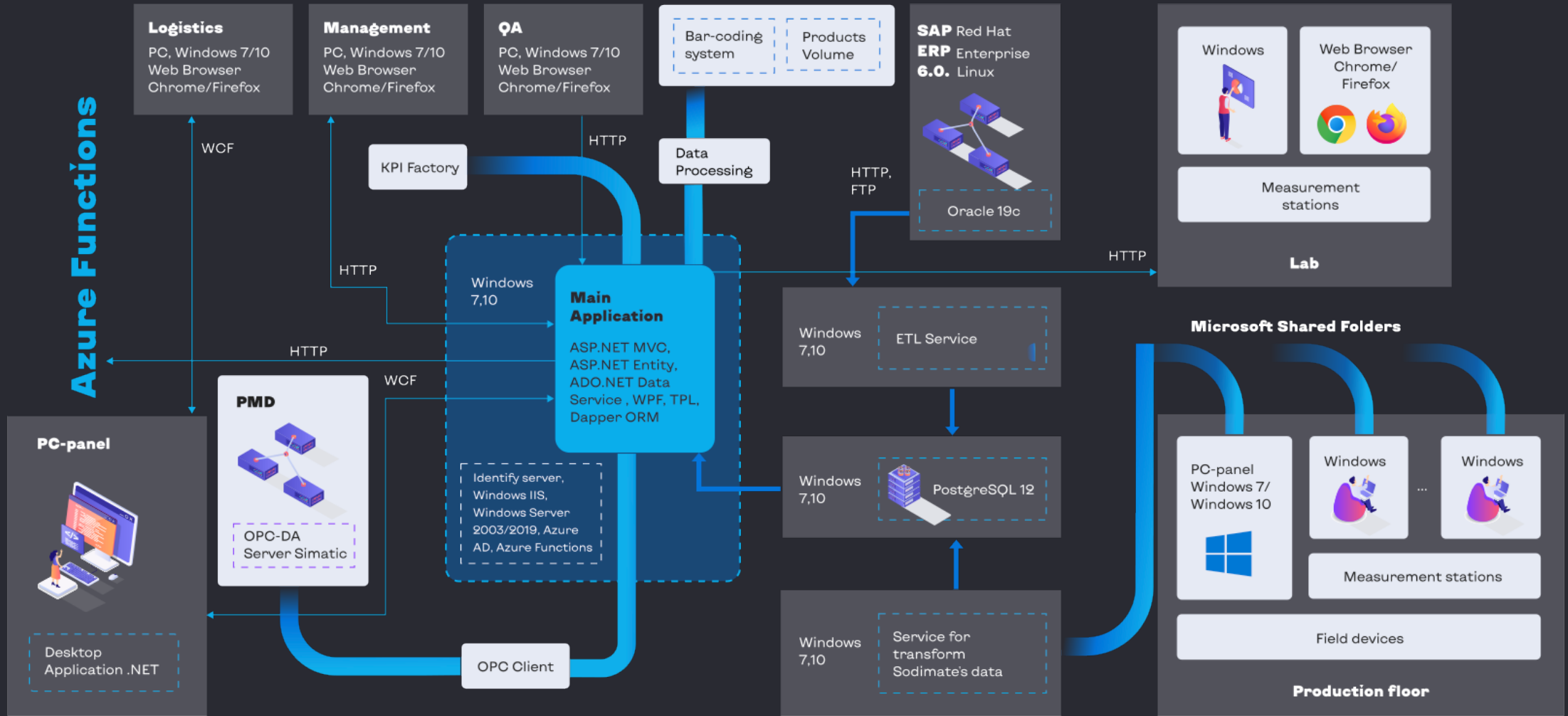


## Additional requirements:

- Cover existing blind spots: material movements on the shop floor, tobacco blend preparation and transportation to cigarette lines, semi-finished products (filter rods) production, work-in-progress accounting, etc.
- Ensure system agility and the possibility of further scalability for the development of the functionality
- User interface: intelligible, friendly, and customizable
- Reliably integration with SAP, SCADAs, FGaccounting, and some other accounting, measurement, and control systems
- Ensure SLA IT-support fulfillment on a 24\*7 level
- Provide full tech documentation to the system and backups of it
- Comply to standard ISO 9001:2015 Quality Management System
- Priority to Microsoft products



# SOLUTION'S ARCHITECTURE



# OUTCOMES

**+2.5%** Operations Efficiency

**+12%** Labor Productivity

**-2.5%** Waste & Rejects

**+2.1%** Quality Index

**-1.5%** Manufacturing Costs





# OUTCOMES



- Algorithm that collects and processes 35+ product parameters (e.g. tobacco blends and cigarettes' physical and chemical characteristics) as well as 20+ technical and technological metrics (e. g. production cycle time, equipment shutdowns, recipe ingredients compliance control, treatment regimes data, work orders execution status, etc.)
- Collection of the FG condition status data in the warehouse, quality check, and confirmation for further dispatch to clients
- Personnel access to production processes control through the online equipment monitoring system in the workshops
- Visual/sound faults alarms system setup
- Tobacco blends feeder control (the correct blend to the right line)
- Quality indices online calculation algorithm that sets business rules of the stepwise system for complex indicators monitoring
- Analysis of the efficiency of the equipment used in production in terms of the volume of output, the adjustments and changeovers durations, as well the source and reason for the shutdown, provision of the corresponding analytical reports
- Production lines status visualization on monitors and the ability to operate it via a control panel
- Ability to administer shopfloor personnel both at the level of the entire system (timesheet) and for individual modules (workplaces of brigade members)

# PROJECT TIMELINE



**Timing:** 6 months

**MVP:** Integration of the cigarettes production lines into the common production system

- Unification of the approach to collecting data from various sources, their centralization, processing, and monitoring
- Algorithm of flexible system setups, starting from individual user's settings and ending with common reports forming and their translation up to top management
- The Finished Goods accounting process interconnection with the marking process control at the stage of packaging products into blocks and palettes
- An integration and expansion of the Warehouses Management Systems and shopfloor logistics



**Timing:** 6 months

**MVP:** Visualization system at the cigarette production lines. Automation of the work-orders loading and distribution by work centers with their fixed sequentiality of the execution during shifts.

- Software development and launch of the monitoring visual panels
- Transmitting of work-orders from SAP to SCADA systems and monitoring panels

# PROJECT TIMELINE



**Timing:** 3 months

**MVP:** Visualization system at the filter-rods production lines.  
Automation of the work-orders loading and distribution by work centres with their fixed sequentiality of the execution during shifts.

- Software development and launch of the monitoring visual panels
- Transmitting of work-orders from SAP to SCADA systems and monitoring pannels



**Timing:** 6 months

**MVP:** Shopfloor personnel management and capacity scheduling automation

- Automation of the collection and storage of the data about staff allocation
- Personnel administration system - automation of monitoring and control
- Human resources management system development





# TEAM



Engineering team spent 2 month in the production facilities to learn about the production processes and coordinate with engineering team

**01** **Analytical stage:**  
Project manager, Business Analyst

**03** **Development stage:**  
Project manager, Business analyst, Team lead, Senior software engineer, Software engineer – 3 person, QA, AQA

**02** **Scooping, wire-framing stage:**  
Systems Architect, Project manager, Business Analyst

**04** **Support stage:**  
Project manager, Team lead, QA

# POSSIBLE APPLICATION


Customized effective production management systems that help not only to quickly control and manage processes, see the situation and make rational operational decisions, but also apply the Lean Manufacturing continuous improvement tools based on analytical reports, constantly monitoring progress, and change trends.




# OUR CONTACTS



 Harju maakond, Tallinn, Kesklinna linnaosa,  
Kaupmehe tn 7-120, 10114,

 +3726991587

 [soft-industry.com](https://soft-industry.com)

