

MASA – Statistical analysis and plan optimization solution for industrial plants

Firebird SQL case study

About us

Elekt Labs is a Czech software company with an international scope. We develop and deploy systems for data collecting, planning and optimization in manufacturing since 2004.

Our customers include Kingspan a.s., global leader in design, development and delivery of advanced building envelopes, for which we have implemented automatized planning, operational control and manufacturing optimization. For manufacturers Ball Aerocan CZ s.r.o. and MORAVIA CANS a.s. we collect and evaluate data from manufacturing lines with connection to ERP and attendance systems. Our software is deployed in many other companies in Czech Republic, Poland and Hungary.

Business challenge

Our main goal is to develop the universal system with high degree of customization with these basic properties:

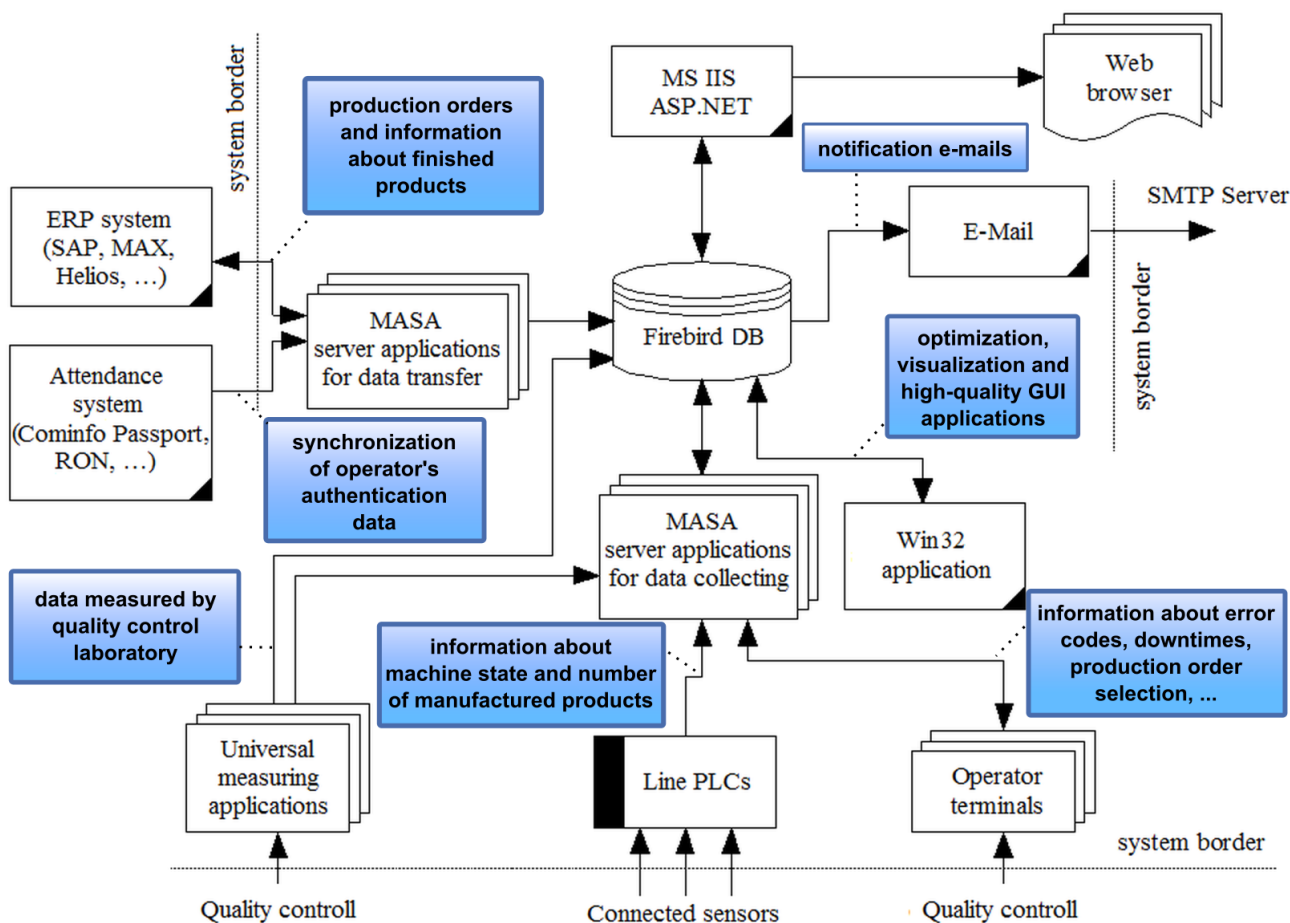
- MES – connection between manufacturing technology and ERP
- Quantification of manufacturing process parameters (OEE, SPC, C_p , C_{pk} , ...)
- Evidencing of the manufacturing process for audits and certification
- Record of changes in machine setting to ensure technological discipline
- Material flow management and traceability.

Solution

We have chosen the Firebird database for our new system [MASA II](#) for several reasons:

- Commercial friendly open source license
- Native support in Delphi
- Native provider for Microsoft .NET
- Easy installation and maintenance

We have developed a set of applications providing connection with technological units (DataCross, ...) and diagnostic and maintenance tools (backup monitor, E-mail agent, database monitor, ...). For data presentation, we have chosen a web application technology, which is a visible part of the system. Special customer requirements are programmed as stand-alone modules.

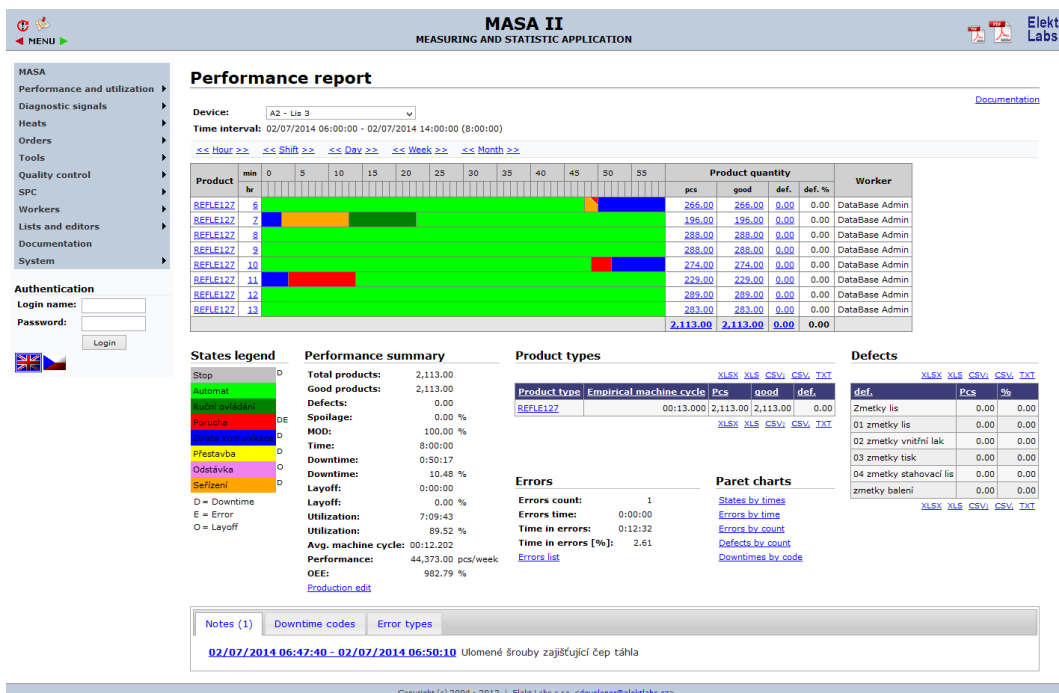


Block diagram of a typical system MASA II installation.

Technical details

Our largest installation of the Firebird SQL has these attributes:

- Database size: ~70 GB
- Average daily database increase: ~80 MB
- Connection with economic systems (SAP, ...)
- Connection with attendance systems
- Terminals connected in manufacture:
 - Number of terminals with text-mode emulation: 32
 - Number of graphical terminals: 8
- Number of terminals in quality control centre: 12
- Number of online connections with database: 43
- Average number of transactions per second: ~3.4
- Average number of transactions per day: ~290 thousand
- Server: MS Windows Server 2008 R2 64 bit
- Database engine: Firebird 2.5.2-64 in SuperClassic mode with UDF usage
- Operating time: 24 x 7



Example of graphical preview of „Lis 3“ machine usage during 8 hour shift. Moreover, you can see a basic performance characteristic of the machine and its operators.

Conclusion

We have a long experience with the Firebird database since version 1.0 and we currently work with version 2.5.3 (32 and 64 bit version).

Firebird provides comparable quality and performance in comparison with commercial databases. Its main advantage is commercial friendly open source license, which allows us to invest more to quality and complexity of our system and to keep high price-value ratio.

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