

A P P L I C A T I O N N O T E

FOOD INDUSTRY

Nutricia Poland

NUTRICIA

LIMS System

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Project assumptions

NUTRICIA is one of the leading producers of food for children. The company is part of NUMICO Corporation – the owner of such brands as Bebiko, BoboVita, Milupa and Cow&Gate. The production plant in Opole has 4 state-of-the-art laboratories: chemical, microbiological, raw materials and production one. These laboratories carry out tests of several dozens of thousands of parameters per month for thousands samples of finished products, semi-finished products and raw materials. Due to the continuous expansion of the assortment of products and increasing the production output, which brings about the increased number of laboratory tests, it came as necessary to implement the comprehensive LIMS - *Laboratory Information Management System* – for automating and streamlining the work of the Quality Control Department.

Askom has been selected for the implementation of the LIMS System. The implementation has been realised based on SIMATIC IT Unilab laboratory software and reports modules of SIMATIC IT Report Manager, which are the components of **SIMATIC IT** – MES system by Siemens, for which ASKOM has, as the only company in Poland, the status of Siemens SIMATIC IT Solution Specialist. SIMATIC IT Unilab platform is in operation in more than 200 laboratories all over the world. The laboratory systems completed on this base comply with all the major standards, including: ISA95, GMP, GAMP, ISO, FDA, HACCP, 21CFR11.

The realisation of the project included the following tasks:

- participation in defining the user requirements in relation to LIMS System,
- developing the functional specification of the system, which will guarantee meeting the user's requirements,
- delivery and configuration of hardware,
- adjusting the SIMATIC IT Unilab system to the user requirements,
- developing the software for interfacing with the ERP system - QAD MFG/Pro,
- installation and implementation of the system,
- training the system users and administrators,
- preparing the workstation documentation,
- assisting in the exploitation of the system.

System requirements

The following requirements for the LIMS system have been defined:

- storing the results of tests centrally,
- automatic generation of samples based on the data from the company ERP system,
- simplifying the sample search through the use of a barcode system,
- automatic creation of test plans,
- communication with advanced measuring devices,
- the possibility of easy generation of reports

The implementation works have covered all the quality control laboratories:

- physicochemical laboratory,
- microbiological laboratory,
- raw materials supply control laboratory,
- BoboVita production laboratory.

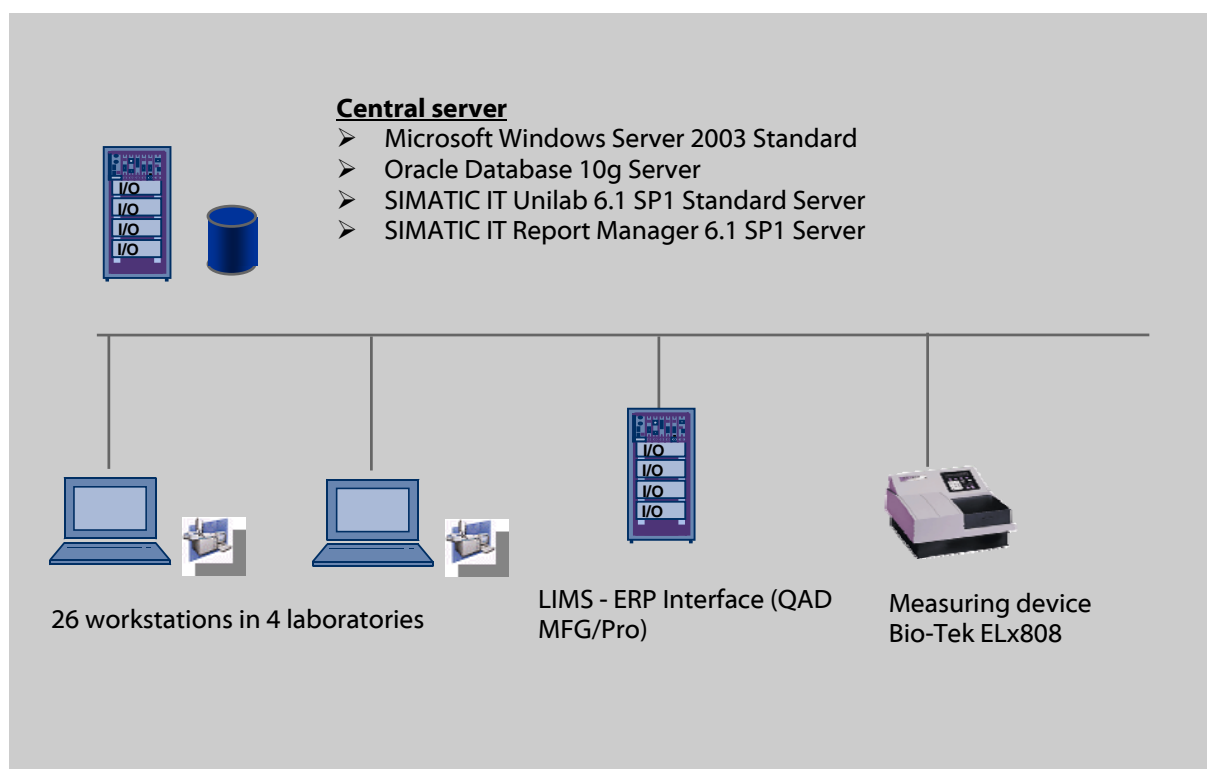
System structure

The primary indicator which determines the size of the LIMS system is the amount of samples entered to the system and the number of users who can simultaneously use the system. The figures for the project under discussion are as follows:

No.	Type of samples	Amount
1	Samples of finished and semi-finished products	11 000
2	Samples of raw materials	1 200
3	External samples	500
4	Environmental samples	200
5	<i>Ad hoc</i> samples	200
TOTAL		13 100

No.	Type of user	Amount
1	Entering the laboratory data	26
2	Reports preparation	11

The system works in the client-server architecture, which means that all the data is stored and processed in the central database server (Oracle 10g), whilst the users use the system by means of client software installed on their desktop computers.



The configuration of the dedicated server, which is the most important element of the system, includes 2 core Intel Xeon processors, 4GB of RAM memory and disk array operating in RAID 1 and 5 system. Based on Microsoft Windows 2003 Server operating system, SQL Oracle 10g2 database has been installed, containing laboratory data and reports repository, software interfacing the LIMS and ERP systems as well as server and client software of SIMATIC IT Unilab and Report Manager.

SIMATIC IT Unilab and Report Manager client software is installed on 26 desktop computers equipped with Microsoft Windows XP Professional operating system and working in the company computer network. Most workstations, where measurements results are entered, are equipped with barcode scanners.

Measuring device - [Bio-Tek ELx808](#) microplate reader - is connected to one of the client PC. The measurement results go directly to the LIMS system database.

Each of the 4 laboratories has one dedicated printer of laboratory labels which are used to label samples by means of barcodes for easy identification

MS SQL Server 2000 database, from which data on the creation of new samples is downloaded, has been installed on a dedicated computer functioning as an interface between IT systems operating in NUTRICIA.

Analysis of laboratory data

In order to accelerate the work of laboratory workers and eliminate human errors, data is entered automatically wherever possible. Most samples are created automatically by the interface program between LIMS and ERP systems. Apart from sample creation, interface program automatically fills in all available data in information sheet on production lots and samples. It also applies to samples created manually from BoboVita department.

Thanks to the implementation of this solution, accepting samples for examination in the laboratory have become easier and comes down only to marking the samples with the use of the printed label and change the sample status in the system by reading the code with the scanner. The appropriate schedule of laboratory examinations is generated on the basis of data included in the information card of the sample.

On individual examination workstations, thanks to the quick results entry list, prepared in the system, laboratory workers may view the samples easily and enter results of the parameters they examine. Additionally, laboratory managers have tasks prepared in the system making it possible to accept or reject lots of goods and raw materials.

SIMATIC IT Unilab - Analyzer - [Request list]

Request type: FIC Numer partii: [dropdown]

Worklists	Numer partii	Rodzaj partii	LAN/SKU	Opis LAN/SKU	Status	Data produkcji	Linia produkcyjna	Rynek
Create requests	00012296	FIC	109870	BEBIKO 3	Confirm Release	2007-01-15	Rovema 14	POLSKA
Request lists	00012297	FIC	109870	BEBIKO 3	Confirm Release	2007-01-16	Rovema 14	POLSKA
Wszyście partie	00012298	FIC	107101	KASZKA MLECZNO-RYZOWA Z BANANAMI	Confirm Release	2007-01-18	Rovema 14	POLSKA

SIMATIC IT Unilab - Analyzer - [Analysis Details of Request <00012297-7> <FIC : Wyroby gotowe odżywkę sypkie>]

Request type: FIC Numer partii: [dropdown]

Worklists	Kod próbki	Kod produktu	Opis	Numer palety	War	Data posiewu (1)	Status	Rodzaj palety	Receptura
Create requests	ML-160107-011	109870	BEBIKO 3	159008520001611502		2007-01-17	Pass	Pierwsza	120459
Request lists	ML-160107-026	109870	BEBIKO 3	159008520001612462		2007-01-17	Pass		120459
Wszyście partie	ML-160107-036	109870	BEBIKO 3	159008520001613490		2007-01-17	Pass		120459
Partie wg czasu	ML-160107-047	109870	BEBIKO 3	159008520001614169		2007-01-17	Pass		120459
Do akceptacji	ML-170107-011	109870	BEBIKO 3	159008520001615159		2007-01-17	Pass		120459
Zaskceptowane	ML-170107-018	109870	BEBIKO 3	159008520001616293		2007-01-17	Pass	Ostatnia	120459
Partie wg daty produkcji	AS-170107-003	Autosampler	Próbka z autosamplera			2007-01-17	Pass		

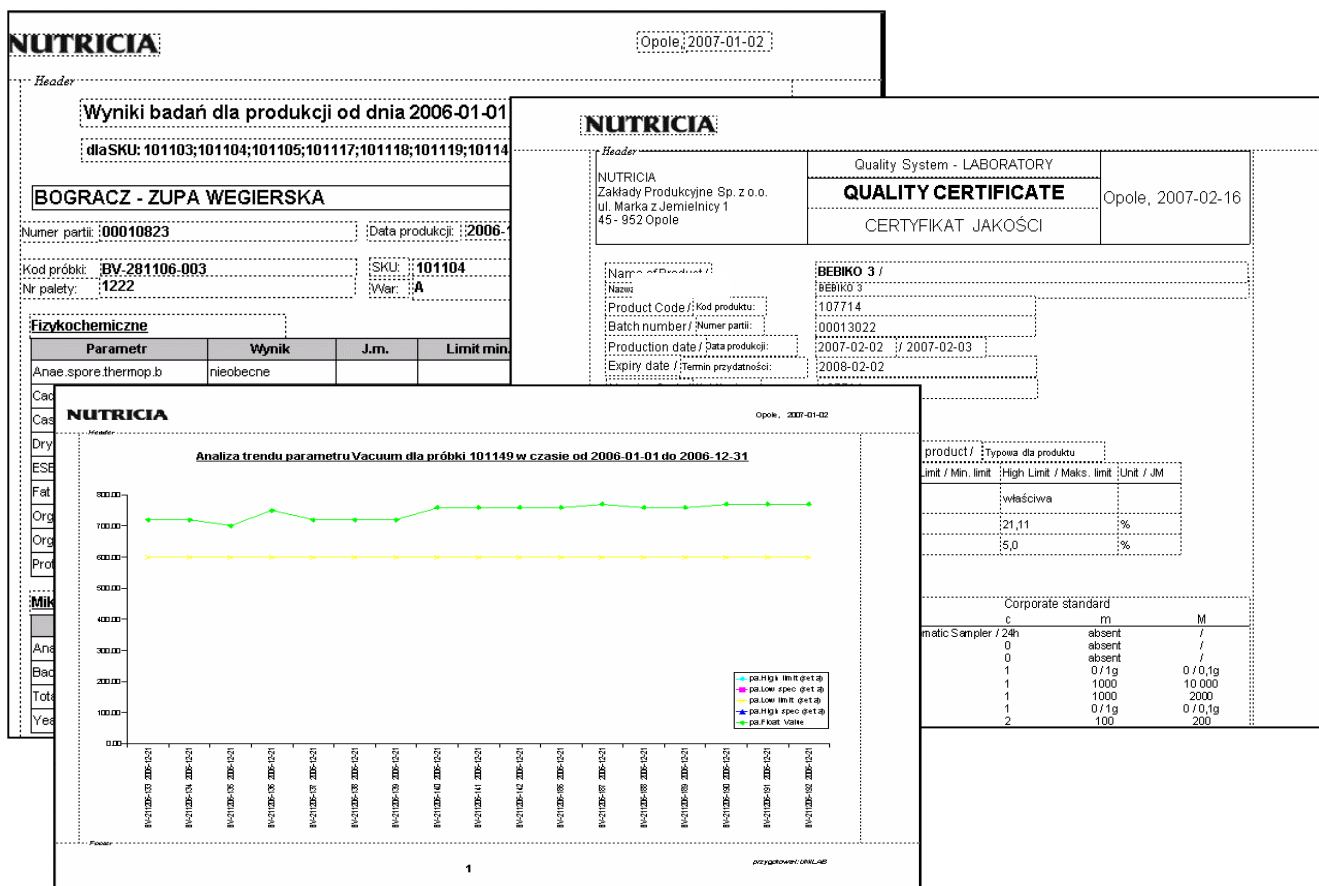
SIMATIC IT Unilab - Analyzer - [Sample list]

Sample type: [dropdown] Rok: 07 Miesiąc: 0701 Dzień: 070108 Status: [dropdown] Created by: [dropdown]

Worklists	Próbka	SKU	Numer palety	Status	Opis	Receptura	Data produkcji	Numer partii	War
Create requests	BV-080107-129	101148	159008520001572872	Cancelled	WARZYWA, Z CIELECINA	4607,03	2007-01-08	00012146	
Request lists	BV-080107-130	104876		In Execution	TRADYCYJNY PUDDING RYZOWY ORGANIC	3901,12	2007-01-02		A
Create samples	BV-080107-131	104876		In Execution	TRADYCYJNY PUDDING RYZOWY ORGANIC	3901,12	2007-01-02		B
Sample lists	BV-080107-132	107479		Available	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	A
Próbki wg typu	BV-080107-133	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	A
Autosampler	BV-080107-134	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	A
Autosampler w/g dnia	BV-080107-135	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	A
Zadania podstawowe	BV-080107-136	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	A
Próbki Chemia BV	BV-080107-137	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	B
Próbki chemia OS	BV-080107-138	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	B
Próbki chemia SUROWCE	BV-080107-139	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	B
Worksheets	BV-080107-140	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	B
MyTasks	BV-080107-141	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	B
	BV-080107-142	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	C
	BV-080107-143	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	C
	BV-080107-144	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	C
	BV-080107-145	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	C
	BV-080107-146	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	C
	BV-080107-147	107479		Pass	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	E
	BV-080107-148	107479		Available	MARCHEW, WOLOWINA, BAKLAZAN	8000,77	2006-12-03	00011120	E

Data presentation

All laboratory data collected in LIMS system, such as production lots list, samples list, results of parameters examinations and measurement methods, can be presented to the user in two ways: directly in SIMATIC IT Unilab measurement program or on a dedicated report in SIMATIC IT Report Manager program. The advantage of the former solution is the ability to free search of data by going between the associated elements, e.g. from the list of production lots, one can go to the list of samples taken from a selected lot and then the result of a specific parameter for the selected sample. The latter solution, basing on Business Objects software, which is an industry standard in reporting, offers plenty of presentation and data analysis opportunities.



Reports prepared in the LIMS system are very clear. They may present data in the form of tables or clear diagrams. Each report template prepared earlier can be easily updated many times at any moment. Preparing own reports is easy and intuitive as it does not require IT knowledge from the user. The report may be printed or saved in PDF format. Data included in the report can be saved for further analysis, e.g. as Microsoft Excel sheet.