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**«Database management systems application for the organization's  
metrological support»**

**M S Stepanov, I G Koshliakova, O Yu Sorochnikina and K V Kirimova**

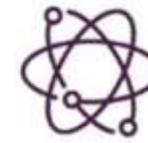
# Problem statement

Metrological support is of utmost importance in any product manufacture. The main metrological assurance component, is the choice of the measuring instruments, taking into account their metrological characteristics, design and dimensions, reliability, performance.

The most complete existing measuring instruments information is contained in the State measuring instruments register. It contains a very large data amount, and therefore the necessary information selection is a very time-consuming task.

A convenient way to solve this problem for organizations is to create an electronic platform for the necessary information storage. One of the information storage forms is a database. The most accessible and popular relational database management system is Access, which is part of the Microsoft Office.

For example, the simplest measuring instruments database basis may contain two interrelated tables: "Measuring instruments" and "Technical characteristics". Further, such a database can be developed by adding other related tables. Figure 1 shows an example of a table in the "Measuring Instruments" database.



measured value	type	model	price	complete inf
consumption and volume of hydroalcoholic solutions	Alcohol measuring systems	absolut	0,00p.	Word 97 - 2003
consumption and volume of hydroalcoholic solutions	Alcohol measuring systems	Asus	0,00p.	Word 97 - 2003
weight	Analytical weighing-machine	CAS CAUY 120	56 647,00p.	Word 97 - 2003
weight	laboratory weighing-machine	CAS CUW-8200S	0,00p.	Word 97 - 2003
weight	laboratory weighing-machine	CAS CUX-4200S	0,00p.	Word 97 - 2003
weight	laboratory weighing-machine	CAS CUX-6200H	0,00p.	Word 97 - 2003
weight	laboratory weighing-machine	CAS CUX-8200S	0,00p.	Word 97 - 2003
weight	laboratory weighing-machine	CAS MW-II	0,00p.	Word 97 - 2003
weight	laboratory weighing-machine	CAS MWP-300H	0,00p.	Word 97 - 2003
acidity	stationary pH meter	HI 8314	0,00p.	Word 97 - 2003
acidity	stationary pH meter	HI 9024 и HI 9025	0,00p.	Word 97 - 2003
acidity	stationary pH meter	HI 98XXX Series	0,00p.	Word 97 - 2003
acidity	stationary pH meter	HI 991XXX	0,00p.	Word 97 - 2003
refractive index of n lines D of the spectrum and average di	refractometer	IRF-4545 2M	0,00p.	Word 97 - 2003
refractive index of scattering liquids	refractometer	IRF-464	0,00p.	Word 97 - 2003
express analysis of the composition, quality, condition of pr	refractometer	IRF-470	0,00p.	Word 97 - 2003
acidity	stationary pH meter	pH 315i	0,00p.	Word 97 - 2003
acidity	stationary pH meter	pH 330i	0,00p.	Word 97 - 2003
acidity	stationary pH meter	pH 340i	0,00p.	Word 97 - 2003
acidity	stationary pH meter	PH212	0,00p.	Word 97 - 2003

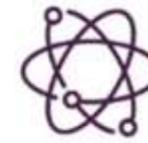
Figure 1. The table in the "Measuring Instruments" database

A typical "Measuring Instruments" table view is shown in the figure 2. This table contains the following fields: measured value, type, model, price, complete information.

The screenshot shows a Microsoft Access window displaying a table view for the 'measuring instruments' table. The table has a hierarchical structure with a 'Navigation Pane' on the left. The main table view shows a list of records, each representing a different instrument. The columns are: 'measured value' (with sub-columns for 'upper meas.', 'lower meas.', and 'marginal error'), 'type', 'model', 'price', and 'complete inf.'. The records are as follows:

measured value	type	model	price	complete inf.
<ul style="list-style-type: none"> <li>upper meas.: 3000</li> <li>lower meas.: 500</li> <li>marginal error: 0.01</li> </ul>	laboratory weighing-machine	CAS CUW-8200S	0,00p.	Word 97 - 2003
<ul style="list-style-type: none"> <li>upper meas.: 3000</li> <li>lower meas.: 500</li> <li>marginal error: 0.01</li> </ul>	laboratory weighing-machine	CAS CUX-4200S	0,00p.	Word 97 - 2003
<ul style="list-style-type: none"> <li>upper meas.: 3000</li> <li>lower meas.: 500</li> <li>marginal error: 0.0001</li> </ul>	laboratory weighing-machine	CAS CUX-6200H	0,00p.	Word 97 - 2003
<ul style="list-style-type: none"> <li>upper meas.: 3000</li> <li>lower meas.: 500</li> <li>marginal error: 0.0001</li> </ul>	laboratory weighing-machine	CAS CUX-8200S	0,00p.	Word 97 - 2003
<ul style="list-style-type: none"> <li>upper meas.: 3000</li> <li>lower meas.: 500</li> <li>marginal error: 0</li> </ul>	laboratory weighing-machine	CAS MW-II	0,00p.	Word 97 - 2003

Figure 2. "Measuring instruments" table view



The corresponding "Technical characteristics" table (Figure 3) contains the following fields: model, upper measurement limit, lower measurement limit, maximum error, weight, dimensions, output signal type, scale division.

model	upper meas	lower meas	marginal error	weight	dimensions	output signa	division valu	Add
CAS CAUY 120	1200	100	0.01	7kg	220*330*310mm	discrete	0	
	measured value			type	price	complete inf	Add New Field	
				Analytical weighing-machine	56 647,00p. Word 97 - 2003			
					0,00p.			
CAS CUW-82005	3000	500	0.01	4.6kg	190*317*78mm	discrete	1g	
	measured value			type	price	complete inf	Add New Field	
				laboratory weighing-machine	0,00p. Word 97 - 2003			
					0,00p.			
CAS CUX-42005			0.0001	2.9kg	190*317*78mm	discrete	1g	
	measured value			type	price	complete inf	Add New Field	
				laboratory weighing-machine	0,00p. Word 97 - 2003			
					0,00p.			
CAS CUX-6200H			0.0001	2.9kg	190*317*78mm	discrete	0.01g	
	measured value			type	price	complete inf	Add New Field	
				laboratory weighing-machine	0,00p. Word 97 - 2003			
					0,00p.			
CAS CUX-82005			0	2.9kg	0190*317*78mm		1g	
	measured value			type	price	complete inf	Add New Field	
				laboratory weighing-machine	0,00p. Word 97 - 2003			

Figure 3. View of the "Specifications" table



## Conclusions

The Microsoft Access system using to automate metrological support in an organization can significantly speed up the necessary information finding and using process, eliminate possible errors, increase work productivity, and increase the organization's profit.

# Contacts

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