

# APPROACHES OF QUALITY OUTPUTS FROM THE BUSINESS SYSTEMS

KAREL NAIMAN, HANA KOPACKOVA, STANISLAVA SIMONOVA, RENATA BILKOVA  
 Faculty of Economics and Administration, Institute of System Engineering and Informatics  
 University of Pardubice  
 Studentska 84, Pardubice, 53210  
 CZECH REPUBLIC

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*Abstract:* An information system can be described as a set of interrelated information technologies that work together to process, store, retrieve, collect, and distribute information. Information systems reside at various levels and within almost all functional areas within an organization. Users of business system are both common end users and top-level decision makers. Quality of outputs is based on the reporting tools as well as on the abilities of people to understand them and work with them. Strong and powerful way how to present the data without high level user knowledge is discussed.

*Key-Words:* - Business system, information system, database system, reporting tools, OLAP

## 1 Business systems

Digital businesses rely on information systems to streamline operations and improve their connections with customers, business partners, and suppliers. To achieve these goals, digital businesses rely on information systems. For many companies information is their most valuable asset. We can distinguish particular qualities that make information valuable [1]:

- Accuracy: is the information correct? can we rely on it?
- Timeliness: how current is the information?
- Accessibility: can we access the information when we need it?
- Engagement: is the information capable of affecting a decision?
- Application: is the information relevant in the current context?
- Rarity: is the information previously unknown or confidential?

An information system can be described as a set of interrelated information technologies that work together to process, store, retrieve, collect, and distribute information [2]. Information systems reside at various levels and within almost all functional areas within an organization. Therefore, many types of information systems exist - some to process basic transaction, others support top-level decision makers. Database systems are basic software for information systems. The databases are used in the conduct of the day-to-day operations (or transactions) of a business [3]. Although transactional

databases serve a purpose, they are often of limited use to companies needing data for decision making purposes. Transactional databases periodically overwrite existing data with new data. What most companies need is a way to store data on a continuous basis. They need also a method for extracting interesting information from this data. This is where data warehouses come into play.

## 2. Outputs

Data must be understood in order to convert them into information. Therefore, people are the most important element in any business system. Users are different, because business people have various knowledge of information and communication technology (office worker, director, assistant manager etc.) [4].

### 2.1 The Usage of Information Systems

Every individual in business (in information society generally) becomes a user of an information system. We can distinguish direct users; they are customers of online service systems. The customers enter data, which are processed, and receive the output. In other situations, people are undirected users of a computerized system. Undirected users benefit from only the efforts of the system. A knowledge worker is an individual who is responsible for using, creating, and distributing information.

Outputs of information system can be characterized as computerized answer to user enquiry. Thus, outputs of information systems should enable the realization:

- of both an enquiry prepared within the software support (reports),
- And also of a newly defined enquiry.

The user approaches are different according to the varied composition of data environment users [5] [6]. When the specificity of enquiries about business data sources is set, it is possible to trace the aspects of the method of enquiry input, enquiry creator, enquiry quality, and search with the help of key words.

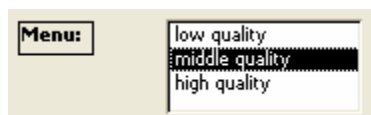


Figure 1: Prepared choice and output for “Middle quality of some regional coefficient”.

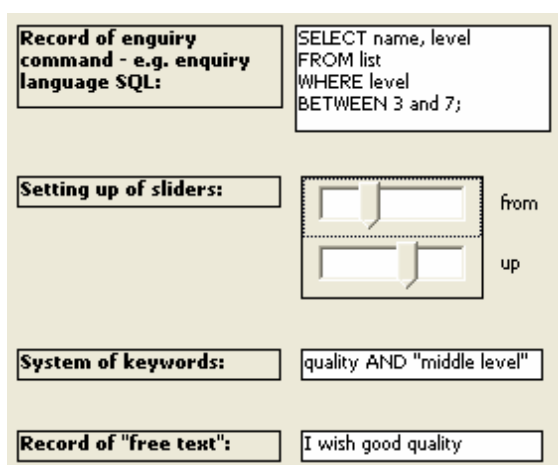


Figure 2: Non-prepared enquiries for “Middle quality of some regional coefficient”.

Outputs method can we divide as:

- Prepared outputs (reports): by the choice of a suitable option within the menu; the output is prepared (in Figure 1),
- New outputs according new enquiry: either by writing the relevant enquiry command in the enquiry language or by the choice of key words within the search system (in Figure 2).

Enquiry creator can be an expert in both business problems and information technologies; such an employee will not have any problems with the user enquiry input. Enquiry creator can be an expert in public administration, it means employee only with limited

knowledge in information technologies for the needs of his profession. The familiarity with terminology of this end user enables a good orientation in the user menu, but the creation of a new enquiry represents a problem. Enquiry creator can be a non-expert, it means employees with minimal knowledge in professional terminology (for the needs of his profession) and with various levels of knowledge in information technologies. Enquiry creator can be also a handicapped person; it means employees with various levels of knowledge in information technologies and with limited possibilities to accept this kind information (according to their handicap).

Output quality is possible to validate according enquiry quality. The targeted report brings answer by the choice of a suitable option within the menu. The question is, if the menu involves suitable choice of reports. Targeted enquiry is represented by correctly and effectively formulated by an expert in information technologies; enquiry is created in the enquiry language or by search in the system of links through key words (Figure 3).

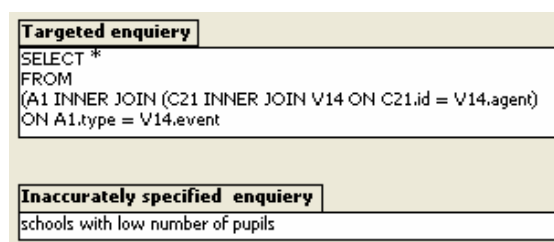


Figure 3: Enquiry quality

The last category is so called inaccurately specified enquiry. It is caused by technological or professional ignorance; these are either error during the creation of a new enquiry or the inquirer, due to an inaccurate familiarity with professional terminology, does not orientate him well in the user menu.

## 2.2 Main specification of proper output

Outputs differ by the managers on different levels of execution process, but one thing is common – reports must be easy to use and clear for non IT people (managers are not IT specialists). The new technologies allow having all the figures every time updated and reports are not only static tables. Modern reports are a live structure where managers can change the selection criteria, views to the data, time periods etc. [7]

### 3. Pivot tables – simple but powerful solution

All these needs are fulfilled by pivot tables in Microsoft Excel. Excel is a tool which is installed on almost all managers' computers; each manager should be able to work with it. Managers are overloaded people (in general) and they often avoid to learning of the new IT methods. Excel is friendly software from their point of view [8]. Let us demonstrate the power of pivot tables. Theoretical background for the pivot tables is based on the multi-dimensional cubes. Normal cubes are based on three-dimensional space with three axes (X, Y and Z). This creates three different views to the cube from two dimensional (printable) point of view (parts X and Y, X and Z, Y and Z). Every view is originated by "rotation" of the cube by the axes. Multi-dimensional cubes are the same, but in the multi-dimensional space. Dimensions on that space are generated by the tracked figures (e.g. customers, selling periods, sales representatives, goods, etc.). Cube itself contains the calculated fields like amounts, prices, averages etc. for every combination of the dimensions. We can simply create reports "Sales representatives by Months" or "Customers by Goods" from the same source only by "rotation" of the cube [9].

### 4. OLAP – professional solution

Usage of simple Excel pivot tables with data in the Excel file can be managed by "power users", no extra knowledge is necessary. The speed or amount limitations are acceptable for small companies. Big companies and companies with the huge amount of tracked items are not satisfied by simple solutions. They have to use something more professional – OLAP (On-Line Analytical Processing) based solutions. Two major database systems on the market (Oracle and Microsoft) included the OLAP solutions into their database systems so we can use it without any additional fees.

OLAP technology is based on non-relational database where the whole multi-dimensional cube is stored. The raw relational data are taken from the database server and stored in pre-calculated form. It depends on the configuration how many "rotations" of the cube are stored; the rest of them must be calculated on-line, during the client application querying. [10]

MS Excel is one of the OLAP client applications – it means that we can define the OLAP source cube and Excel is able to display it. Excel in OLAP model is working only as a viewer and everything is computed on the OLAP server (not on the SQL server, OLAP server can be installed on another machine). This solution reduces the data flows between the Excel and

the server – only requests and computed data are transferred, so the mobile users can access the OLAP server without big delays, also the SQL server load is reduced. Data from the SQL server are requested only by OLAP server in scheduled period and not every time on report opening [11].

The moving of computing to OLAP server significantly reduces the response time. Often requested figures are pre-calculated and stored on the OLAP server so these figures are displayed without delay, the rest of them is calculated on the server (which is normally much faster than users' computers) and it is not dependent on the speed of client computer. Centralized computing also allows having much more active clients than previous technologies [12]. We have tested OLAP solutions with more than 2 000 000 of items without any problem. The only disadvantage of OLAP in comparison with simple pivot tables is the administration of the OLAP server and difficulty of cube and report creation. It is not a task for power users, it requests perfect knowledge and specialized analysts. This is why the OLAP solution is not used as often as Excel based pivot tables however it is based on the same software packages.

### 5. Conclusion

Outputs are the most important part of information systems from the manager's point of view. The proper work of every manager must be based on sufficiency of information for taking decisions. Decision making must be based on the information sufficiency. Many of the current systems store all the company data, but the problem is on the report creation. Data analysis is one of the most expensive parts of data management and it is not simply accessible especially for the small companies. Our solution uses only standard parts of software which are present as a member of common equipment. We are presenting the power of Microsoft Excel in cooperation with data stores. This solution is able to replace many expensive decision systems. Well, the outputs are maybe not so colorful and as pretty as some others, but MS Excel is on almost every PC and everyone is able to work with.

### 6 Acknowledgements

This research and paper was created with a kind support of the Grant Agency of the Czech Republic, grant number GACR 402/05/P155.

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