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Database Usage and Its Importance in Livestock

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ABSTRACT

A database is a regular collection of structured information or data that is stored electronically in a computer system. For this purpose, as a result of various processes, businesses record all kinds of information, whether digital or not. Businesses need this kind of data and records to make accurate and healthy decisions. At the same time, companies must record this information for a long time in order to compete. Since it is possible to quickly access the data stored on the computer, it should be preferred. However, the data should be kept in the form of a database file, not a conventional filing system. In this method, the data can be filtered according to all kinds of criteria and the desired data can be reached quickly. With the data stored in animal husbandry enterprises for a long time, increasing the productivity in animal production, meeting the breeding needs of the desired characteristics, making efficient breeding organizations, and obtaining high income as a result of identifying the animals to be extracted from the herd will be made easier. At the same time, with the data stored for a long time, the legislation will be fulfilled in addition to quality and safe food monitoring from farm to table. Database software for storing technical data in animal husbandry; MySQL, Microsoft SQL, Microsoft Access, Postrage SQL, Oracle, Firebird, IBM DB2 are some of them. In this study, it is aimed to give information about the usage possibilities of databases in animal husbandry, the value and importance it will add to animal husbandry enterprise.

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INTRODUCTION

Databases play an important role in making true and healthy decisions. With the data stored for a long time in livestock enterprises will facilitate increasing the productivity in animal production, revealing animal breeding values, ensuring the breeding needs of the desired characteristics, making efficient breeding organizations, determining the animals to be sorted and kept. Therefore, earning high income will be easier as a result of them (Çelikyürek & Aygün, 2014; Çelikyürek, 2015).

One of the most important factors affecting success in animal husbandry is the methods of animal breeding and genetic success obtained from these methods, the status of producer enterprises, determination of product prices according to quality, and strong animal husbandry organizations. Information and technology sharing are important in the effectiveness of these organizations. The most prominent factor on the basis of animal breeding all over the world is the records kept by creating a database and the analyzes conducted accordingly. As a result of the advances in the field of gene technology and molecular biology, genomic analysis has been implemented in a database based on animal breeding. In addition to bioinformatics information in animal production, creation of database (e-breeding) to keep records of inventory of all stages, breeding index, pre-breeding index, parent, importing information of yield, and breeding values to database are also important in terms of creating country model of breeding, productivity in livestock, and reaching advanced levels by usage of biotechnological applications in our country (Anonymous, 2019b).

Database and application areas

As a general definition, database is a collection of organized data. All data recorded through application software using computer technologies are transferred to databases.

Using areas of databases are quite high. It is used in many areas from banking to automotive industry, health information systems, company management, telecommunication systems and air transportation (Uyar, 2016).

Databases have also a great use in animal husbandry nowadays. It benefits in many cases and stages such as herd management of animals, regional and national breeding projects, milking, meat quality, milk structure - composition, trade of animals, counting, weighing, diagnosis of diseases, detection of low yields, selection of animals to use as stud, gathering information about breeders and enterprises that the animals come from, and the history of meat in the market.

For following obligation that EU adjustment programs of Turkey brings in the framework of the basic information about animals at the national level database recording the animal's Ministry of follow-up to do 10.02.2009 dated 27137 numbered official published in the newspaper " Regulation on the identification, registration and monitoring of sheep and goat animals" was the other objective (Çelikyürek, 2015; Çelikyürek & Karakuş, 2017). For these reasons, it is necessary to understand the concept of database quickly and to understand the issues such as obtaining and maintaining the correct data.

Databases and selection logic

Before starting to work in any database program, a database design suitable with the work should be done. This is the most important stage. Which database to choose in a project is a decision about the size of the project. Some of the popular database systems can be listed as MySQL, Informix, IBM DB2, Microsoft Access, Progress DBMS, PostgreSQL, Microsoft SQL Server, SQLite, Microsoft Visual FoxPro, Oracle Database, Firebird, Sybase Adaptive Server Enterprise, Teradata, CSQL, and OpenLink Virtuoso.

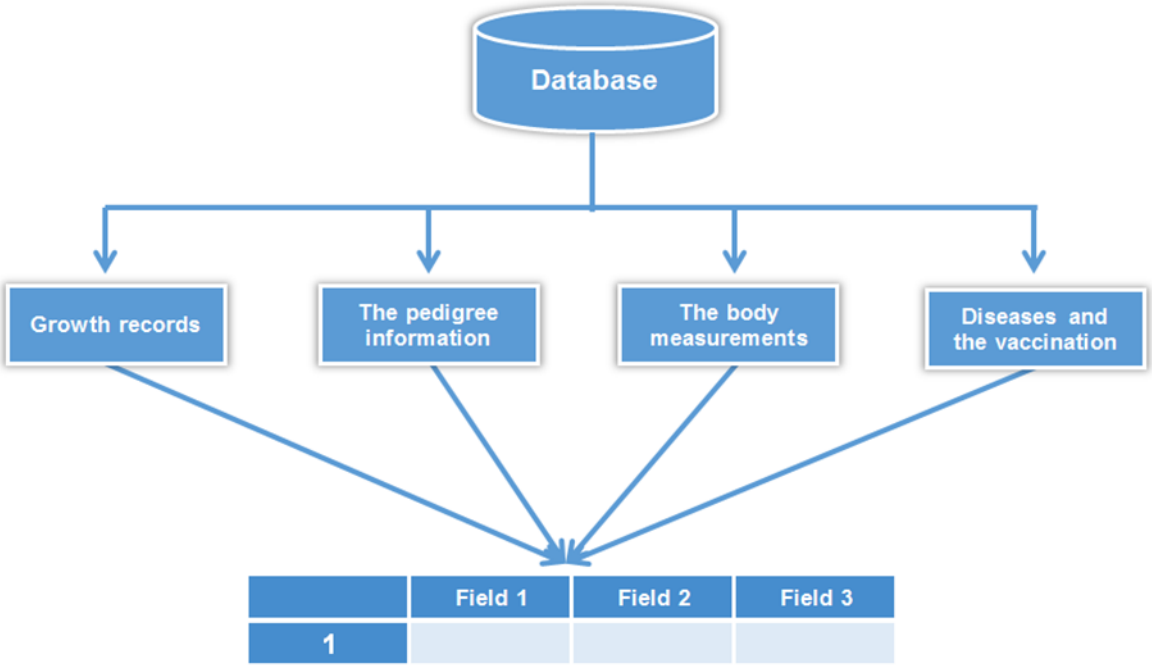

Figure 1: The tables used in the processing of the records in the database, a schematic representation of the base file system area and data in the table.

Protection and preservation of records

The widespread use of computers in the production of documents and information has accelerated the process of document and information production. Consequently, it has become increasingly impossible to control and process because amount of information has reached enormous numbers. Information age is determined as a period in which we begin to worship

knowledge instead of trying to use information as a tool to understand ourselves, our work and our work environment (Anonymous, 2019d; Ataman, 2005).

Information and documents are stored to reuse when needed in the future. It is a notion that we are all familiar with storing information on paper or a similar carrier for many years. However, when it comes to keep document or information in an electronic platform, the time that comes to mind is no longer than a few months or no more than two to three years. However, it may be necessary to store the information in electronic environment for long periods such as 50 years, 100 years and even forever. Therefore, the concept of "archiving", which we have mentioned here, goes far beyond the concept of "backup" as a period of time. Doing this in electronic environment is not as easy as we are used to do in traditional environments (Ataman, 2005).

When archiving records in computer environments, they are protected from unrelated persons through security systems such as authentication and authorization with the help of operating systems and application software. However, it is still not appropriate to keep very important information open on the computer. Many regulations and laws are closely related to the storage of important data (Anonymous, 2019e).

Nowadays, data can be kept encrypted while being stored in addition to being encrypted between computers. There are many solutions to keep data in storage. Data can be stored by operating systems, applications, or by encrypting hardware encryption solutions (Anonymous, 2019e).

Comparison of databases

When comparing, it is useful to compare with two different main titles. The first of these should be the comparison of DBMS with similar structure, and the second should be the comparison to be made as a result of determining the characteristics that can be considered important for the enterprise. Unfortunately, this is not an easy task. It is not true to say that one popular database is better than the other. Stable and problem-free systems can be created with all databases. However, when databases are compared, each database has advantages and disadvantages compared to each other.

As the most important features in comparing databases; performance, cost, platform to be used, scalability support, security support, software-related general support and software sustainability can be counted.

Table 1. *Comparison of popular databases according to various features (Şahin, 2019)*

Features	Oracle	DB2	Ms SQL Server	MySQL	Postgre SQL
SQL Language Features	Very Good	Very Good	Very Good	Normal	Good
Programming Features	Very Good	Very Good	Very Good	Normal	Very Good
Ease of Use	Normal	Low	Very Good	Good	Good
Multiple User Access	Very Good	Good	Normal	Normal	Normal
Security	Very Good	Good	Good	Normal	Normal
Size of Data	Very Good	Very Good	Very Good	Good	Normal
Portability of DBMS	Very Good	Good	Low	Good	Good
Standard Interface	Very Good	Very Good	Good	Good	Good
Compatible with Web Tech.	Very Good	Very Good	Good	Good	Good
Price	Expensive	Normal	Cheap	Free	Free

Usage and importance of databases

From the past to the present day, the most effective ways of keeping records, keeping them for a long time, being able to reuse them when needed, fast access to the desired information and filtering the records according to some characteristics have been investigated both in animal husbandry and in other fields.

Many methods have been tried in these studies and most effective methods have been put into practice today. The first of the most commonly used is that the records are filed in paper format (Tonta, 2019). This method is not preferred after the spread of Computer Technologies in addition to having many negative features. Basically, storing big data in paper output is a long and tiring process in case of analyzing, comparing, finding and processing the desired data.

The second method is the so-called traditional filing method. This method has many drawbacks. They can be listed as (. Anonymous, 2019c; Baykara, 2019; Burma, 2019; Özkan, 2019)

- Data repetition and inconsistency,
- Failure to share data,
- Any new requirements and changes in applications can only be met by experts,
- Difficulties in accessing and obtaining data,
- Obligation to know complex data storage structures and access methods,
- Integrity issues,
- Security, privacy issues,
- Design differences, lack of standardization,
- Operating problems such as backup, restart, repair.

The third method is the Database Management System. Advantages of this method over the conventional method are; (Baykara, 2019; Burma, 2019; Sancak, 2019)

- Preventing duplication of common data; ensuring centralized control and consistency of data
- Ensuring data sharing
- Hiding physical structure and access method complexities from users with multi-tier architectures
- Providing each user with only the data of interest in easy, understandable structures as they are used to
- Facilitation of application software development with the analysis, design and development tools provided
- Providing the necessary facilities for data integrity, establishing mechanisms
- Ensuring security and confidentiality at the desired level
- Resolving operating problems such as backup/restart/repair.

The Database Management System has some disadvantages at the least. The first of these is that the installation and maintenance of the database system is more expensive and difficult than the traditional file system. The second one is that when some components are not well designed in the database system, it can lead to serious system failures (Anonymous, 2019a; Sancak, 2019).

CONCLUSION

When all these methods are taken into consideration, the number of animals in the enterprise, the size of the enterprise, the working area of the enterprise (breeding, crossbreeding studies, etc.), whether the records will be used at a later date, the technological infrastructure of the enterprise, the value that the records will add to the enterprise, and the adequacy of the records in the database should be considered when deciding in which condition and how the enterprises will keep their records. In determining this method, cost analysis should be performed by considering the most important criteria and other factors for the enterprise. A decision will be reached at the end of the decision stage studies. Because starting from paid and free alternatives until having desired process, DBMS alternatives are available with different kind of features. The important issue is the certainty of the company's decision to keep the records and transfer them to the future periods. The data stored for a long time in livestock enterprises will play a crucial role in increasing the productivity in animal production, revealing animal breeding values, meeting qualified breeding needs, making effective breeding organizations, obtaining high income, determining the animals to be kept and kept. For this purpose, it is extremely important to keep the data in animal husbandry in the database for long periods.

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