

SCIENTIFIC PAPER

CAPRIDROID: a virtual guide for Android cell phones aimed at goat raisers

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ABSTRACT: A software application (virtual guide), called CAPRIDROID, was designed for goat farming, aimed at farmers, extension workers and other people that are related to this activity and have access to cell phones with Android system version 2.3.3 and higher. The software application was developed under General Public License (GPL), and its size is 2 MB. The primary language of the application developed and compiled is Java 7.0. This computer tool in the form of interactive book offers updated information about goat farming systems under sustainable conditions, and in it the good practices concerning feeding, reproduction, health, breeding, among others, are detailed. Among the advantages of this software application it can be stated that it includes pictures, figures and tables; on the other hand, given the flexibility of its design, it can be updated and new options can be included according to the user's interests. It is concluded that this computer product contains valuable information for farmers allowing to improve decision making in the management of goat herds.

Keywords: computer science, animal production, decision-making

INTRODUCTION

The fast development of technology has marked the life of human beings. The farmers committed to emerging economies until 2020 will be the focus of investments close to 140 billion USD by the technology sector; in the next three decades 80 % of their profitability will originate from the adequate use of mobile systems (Khurana and Sohal, 2011; Janus, 2012).

The firms Vodafone and Accenture presented in 2013 a study titled Connected Agriculture, in which they evaluate the advantages of mobile data services for small farming exploitations, which, in general, work under adverse circumstances (Hernández-Orallo, 2011; Landini *et al.*, 2013).

On the other hand, goat productions can be productive and profitable if farming professionals and livestock production farmers, besides having the necessary knowledge, possess the technological elements that help them in decision-making and an optimum management of the animals (Landini, 2012; Flores and Ramírez, 2013). In this sense, the identification of the potentialities of rural areas from their specificities is necessary, allowing the solution of their problems with the active participation of social actors and lower external dependence (Altieri and Toledo, 2011).

The objective of this work was to respond to such needs, through the design of a virtual guide (Capridroid) for goat farming.

METHODOLOGY

The computer software application Capridroid was developed under General Public License (GPL), in a version for mobile terminals that function with the Android system. For the visual materials the Creative Commons (CC) free license was used. An Integrated Development Environment (IDE) and Android APPMK (Android Magazine App Maker Professional) applications were manipulated for the elaboration; this is an IDE of complements previously compiled with the Python programming language which dissociates the embedded libraries towards a conversion into Android operative system, in order to have a native application for cell phones with only one programming language.

As primary language of the application, Java7.0 was used, which utilizes the JDK (Java Development Kit) virtualization platform 7.9 JFree for obtaining the master libraries, which represent the content of the manual of good practices for goat rearing, arranged to be read by the programming language. This application is executed and runs the Dalvik Virtual Machine tests to take the necessary

instructions to the mobile processor. The interfaces were previously compiled and grouped with the Eclipse development IDE, which propitiates the definition of the use cases of the project. Thus, the menus and visual layouts levitate over and floatingly to the Java dynamic environment layer to show the contents. The above-explained elements allow a correct optimization of the screen space, as well as horizontal and vertical movements of the information and the menus.

Capridroid is the version for cell phones of the *Manual de buenas prácticas para la crianza bovina* (*Manual of good practices for goat farming*), previously elaborated by the authors of this work and with registry number 3864-12-2014 at the National Copyright Center (CENDA, for its initials in Spanish) of Cuba.

The software application has unpublished images that were directly taken in the field by the authors. The logo was designed with Adobe Photoshop CS6 and manipulated with creative design techniques by the designers-authors.

This version of the software application has a size of around 2 MB, so that the load in memory is lightened and RAM usage is reduced, which makes it practically imperceptible.

RESULTS AND DISCUSSION

Capridroid is a computer tool that is available for Android and IOS systems, is valid to be used in Android cell phones version 2.3.3 and higher, and provides recent and highly updated information about goat farming systems under sustainable conditions. Thus basically all the necessary information is offered to the client so that, step by step, he/she can exert good practices in the farming of his/her goat herd.

The software application is a virtual guide with interactive book format, within which the user turns the pages and has access to a table of contents with the respective chapters of Capridroid as a digital manual which contains the main elements of goat production: cover (fig. 1), introduction, facilities, main breeds, farming, feeding, reproduction, health, breeding, and annexes.

The chapters on feeding, reproduction and health are in turn divided into several sections, in order to facilitate the user's access to specific or most interesting parts. For example, within the feeding chapter the user can go directly to such sections as water consumption, elements for grazing, recommended tree species, or calculation of rations (fig. 2).



Figure 1. Cover of the Capridroid software application.



Figure 2. Details of the Capridroid software application.

Leeuwis and Aarts (2011) state that it is essential that the modern advances of science and technology are at the service of the productive sectors, which constitutes a necessary step to improve efficiency.

One of the main advantages of the program is its versatility and the possibility the client has of personalizing it. In this case the person has the possibility of enlarging the font size; modifying the font color, the space between lines; as well as varying the color of the background depending on whether he/she uses the software application at day or night. Along with this, it is a flexible and easy-to-use program, which includes several options, such as: working with text markers; using the word searcher; and knowing, as the program is being used, the percentage of read text, the time of the day, among other aspects. In this regard, Kuppuswami *et al.* (2003) and Silva *et al.* (2012) state that it is elementary for any software application that it covers the requirements and expectations of the users whom it is aimed at. The software application is specifically created to serve as reference material for the farmers who are dedicated to goat production and covers the basic information needs and requirements.

Sato *et al.* (2006) and Ortiz *et al.* (2010) insist on the fact that the notion of impact as constitutive dynamic process is elementary. Based on the above-stated theory, the possibility of immediate practical application, by goat farmers, of the knowledge transmitted by the software application, achieves the functionality of the link mechanisms between scientific production and farming use, a

vital characteristic in the technology transference process.

Among the advantages that can be ascribed to this software application with regards to other programs that are on commercial sale (OVINCA, OVISOFT, CAPRISOFT), it can be stated that it has a large quantity of images, graphics and tables; this allows, in computer software applications, a higher ease at understanding the content and they make it look nice (Patel *et al.*, 2012; Maurer and Hellmann, 2013). On the other hand, the language utilized allows that it is feasible to be used by a varied sector interested in knowing more about goat farming, which can include from independent farmers to professionals of the sector.

This software application could be progressively improved according to the specific needs of each group of goat production farmers, through the introduction of new variables or fields for the management of different records or data. The flexibility of its design allows to update it and include new options, according to the user's interests.

CONCLUSIONS

The Capridroid software application consists in a virtual guide with information about the basic elements for goat farming, with interactive book format. One of its main advantages lies on the fact that it is a flexible and easy-to-use software application, which allows the user to modify the visualization of the product according to his/her liking and provides him/her with valuable information that allows him/her to improve decision-making.

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