

## Proposal for Designing of New BIOS Program

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### ABSTRACT

In this paper, a proposal for designing and implementation of general BIOS program have been done. This program consider as a modified version derived from previous versions with configure and adding a new activities differs from the others BIOS programs such as learning students, help and adjusting components using mouse only (never using the keyboard) in all windows of the implemented program. Also, the program has a flexibility to add any necessary function or activity.

**Keywords:** BIOS, Security, DOS, System Information.

### مقترح تصميم برنامج نظام الادخال / الاخراج الاساسي (BIOS) جديد

#### الخلاصة

في هذا البحث، تم اقتراح تصميم وبناء برنامج BIOS عام. هذا البرنامج يعتبر نسخة مطورة أشتقت من النسخ السابقة مع تشكيل واطرافة فعاليات جديدة تختلف عن برامج BIOS الاخرى مثل تعليم الطلبة والمساعدة وتغيير في مركبات البرنامج باستخدام الماوس فقط (عدم استخدام لوحة المفاتيح نهائياً) في كل النوافذ للبرنامج المنفذ. كذلك فان هذا البرنامج لديه المرونة في اضافة اي دالة اوفعالية ضرورية اليه.

### INTRODUCTION

**T**he BIOS, is a short hand for *BASIC INPUT OUTPUT SYSTEM* is a set of built-in software routines that give a PC its personality. Although, less than 32 kilobytes of code, the BIOS controls many of the most important functions of the PC: how it interprets keystrokes (Ctrl + Alt + Delete), how it puts characters on the screen, and how and at what speed it communicates through its ports. The BIOS, also, determines the compatibility of the computer and its flexibility in use. Although all BIOSs have the same function; all are not the same. <sup>[1]</sup> The BIOS is the interface between software and hardware that allow software and hardware to communicate and interact with each other. <sup>[2]</sup>

BIOS refers to the software code run by a controller or a computer when first powered on. The primary function of BIOS is to prepare the machine so other software programs stored on various distributed modules can load, execute, and assume control of the controller or computer. The other main responsibilities of the BIOS include booting the system, and providing the BIOS setup program that allows changing BIOS parameters.<sup>[3]</sup>

The BIOS software is built into the PC, and is the first code run by a PC when powered on ('boot firmware'). The primary function of the BIOS is to be loaded to and start an operating system. When the PC starts up, the first job for the BIOS is to initialize and identify system devices such as the video display card, keyboard and mouse, hard disk, CD/DVD drive and other hardware. The BIOS then locates software held on a peripheral device (designated as a 'boot device'), such as a hard disk or a CD, and loads and executes that software, giving it control of the PC. This process is known as *booting*, or booting up, which is short for bootstrapping. BIOS software is stored on a non-volatile ROM chip built into the system on the motherboard. The BIOS software is specifically designed to work with the particular type of system in question, including having knowledge of the workings of various devices that make up the complementary chipset of the system. In modern computer systems, the BIOS chip's contents can be rewritten allowing BIOS software to be upgraded.<sup>[4][5]</sup>

### BIOS WINDOWS

When the BIOS program runs, the welcome window will appear and contain the name of the computer with three options, these are (F2 bios), (F10 booting) and (DBCLICK=Keyboard). Firstly, the user must do a double click to open the keyboard in order to choose F2 or F10 as shown in the figure (1) below.



Figure (1) welcome window

If the user chooses F2, then he will enter the setting of bios. For all functions in this window, a simple help in Arabic and English languages designed, when the mouse pointer touches the buttons, in the two sides so as to explain the function mean in simple words. The main functions in this window are: (figure (2, 3))



Figure (2) Bios setup utility

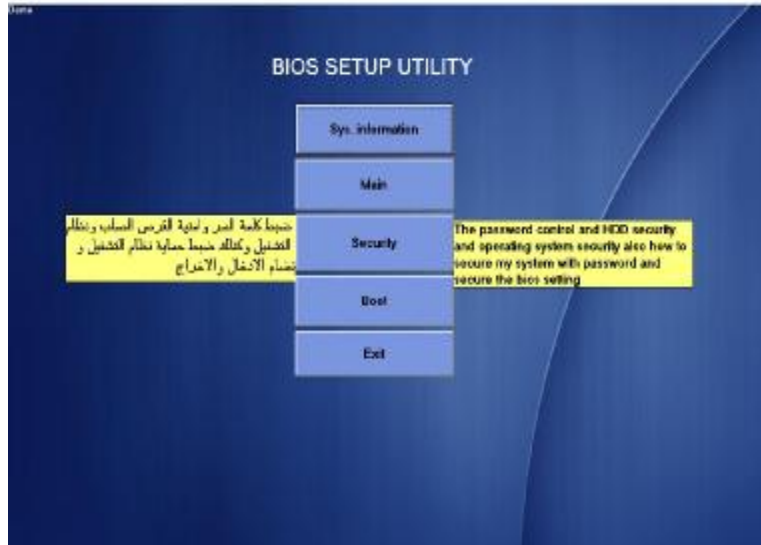


Figure (3) the help on the buttons

### SYSTEM INFORMATION

contains general information about the computer that is CPU information and capacity of the hard disk. Also, the capacity of each partition as shown in figure (4). In the end of window (down), a bar have some keys for help such as ESC to exit, DBCLICK to run keyboard in the window and ENTER to select.

The program takes the information displayed from the computer that the program installed on it.



Figure (4) system information

**Main:** contains several functions such as time and date, system memory, free memory, etc, as shown in figure (5) below. The functions designed for display the size of memory, free memory and setting to quick boot, network boot, D2D recovery and using SATA mode. A help in the right side of the window was designed for the user.



Figure (5) the "MAIN" window

**Security:** contains functions of system password, H.D.D password, supervised password, and User password. This variety in passwords to give strong and severalty in security. In the right side of the window, a help was wrote to explain the functions as shown in figure (6).

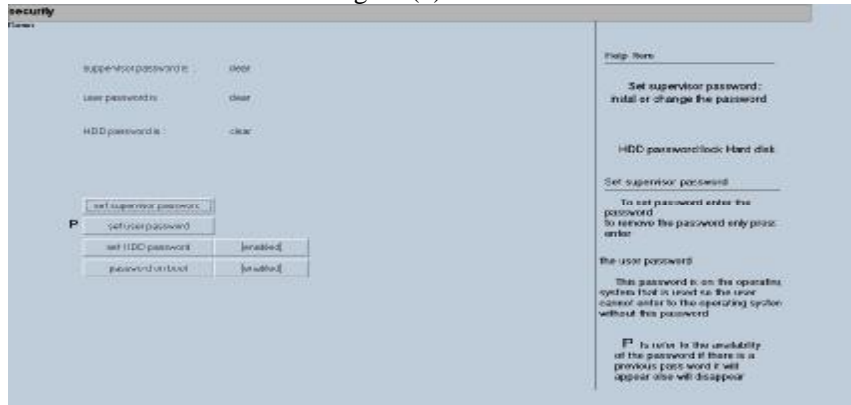


Figure (6) "Security" window

**Boot:** contains four buttons to boot from CD/DVD, NETWORK, external USB flash and from H.D.D.; and the fifth button is for enter DOS that is design to give the user possibility to enter DOS from BIOS. However, a help was added to this function to explain the DOS instructions. Each buttons, expect the last button, connected to the windows simulator designed for learning and in the real implementation of BIOS, it will contain original copy of windows as shown in figure (7).

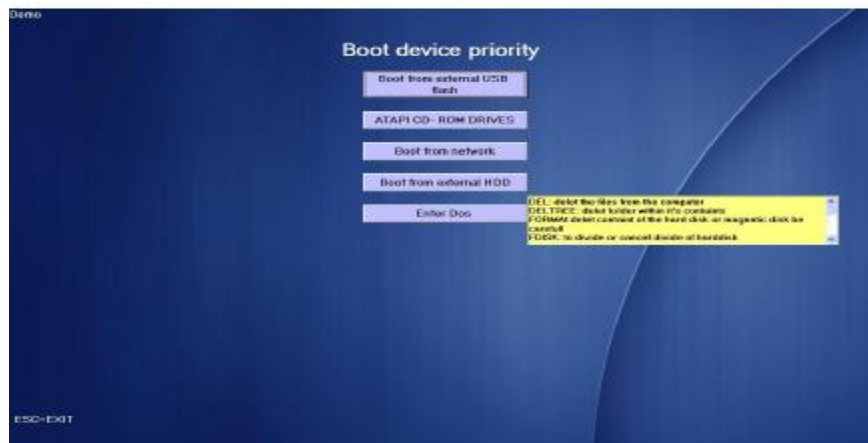


Figure (7) Boot device priority window

**Exit:** this button designed for quit from the software.

### VERIFYING VALUES

The main property of this BIOS program is use keyboard design and implements inside it instead of the keyboard of the computer. Also, using the mouse to change values through the keyboard designed. In the current BIOS, this property is not found and the mouse is to be used for browsing only.

Notice in figure (1), when the user double clicked on the same window, a keyboard will appear to choose F2 or F10. Also, in the figure (5), when the user clicked on the system date and time button with double clicked on the window, sub window for setting date and time and the keyboard will appear to set and change values of the time and date of the computer as shown in figure (8). The keyboard will appear when double clicked on the window and use to set or change the passwords as shown in figure (9). Generally, the keyboard appeared to press ESC button to quit from the window and return to the previous window.

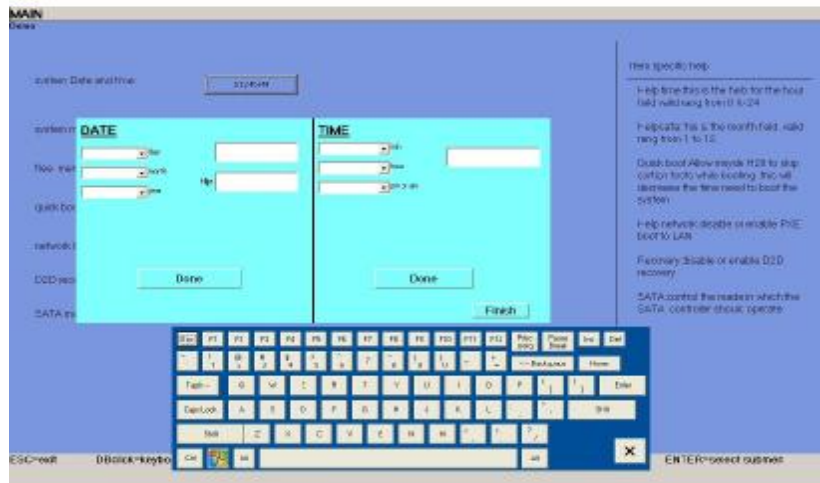


Figure (8) verifying values of date and time

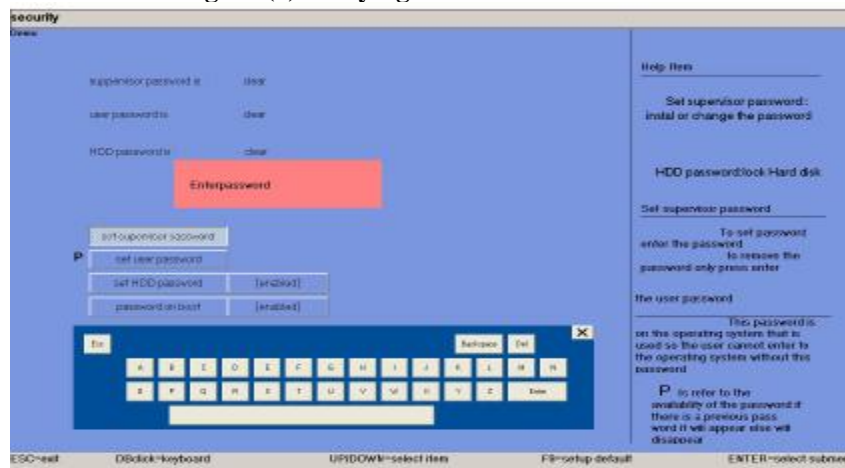


Figure (9) verifying values of passwords

### BOOTING

When the user choose F10 in the welcome window (figure (1)) or press 'Boot' button in the window shown in figure (2), the boot window will appear (figure (10)) and as explain previous, its contains five choices and these are "boot from external USB flash", "ATAPI CD-ROM DRIVES", "Boot from network", "Boot from external HDD" and "Enter Dos". Any click on them will open windows options that is (win XP, win VISTA, and Win NT) (figure (11)) except the last button (Enter Dos). This function design to enter to the operating system (DOS) and use it with double clicked on the window to appearing keyboard (figure (12)). Also, a help will appear when the user point on the button (figure (13)).

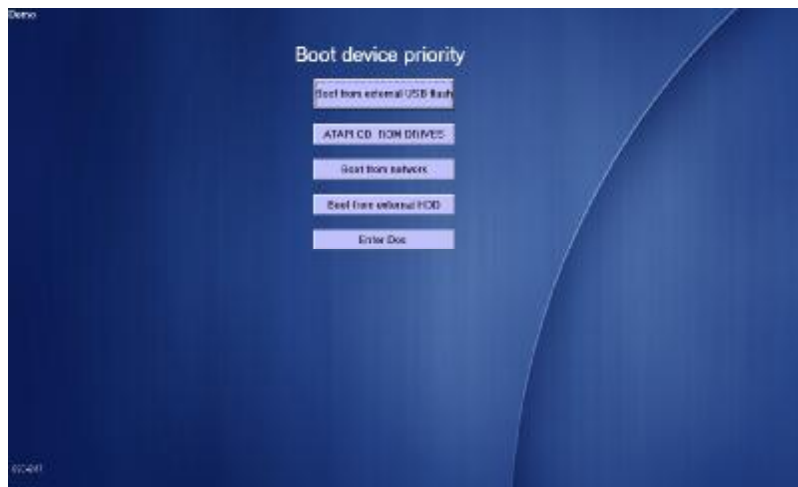


Figure (10) booting window



Figure (11) choosing windows setup



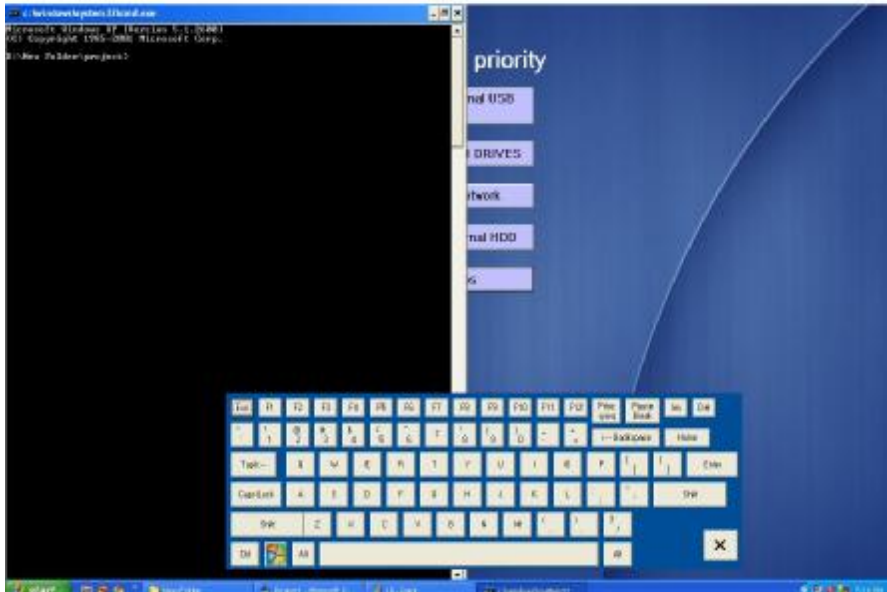


Figure (12) DOS window with keyboard

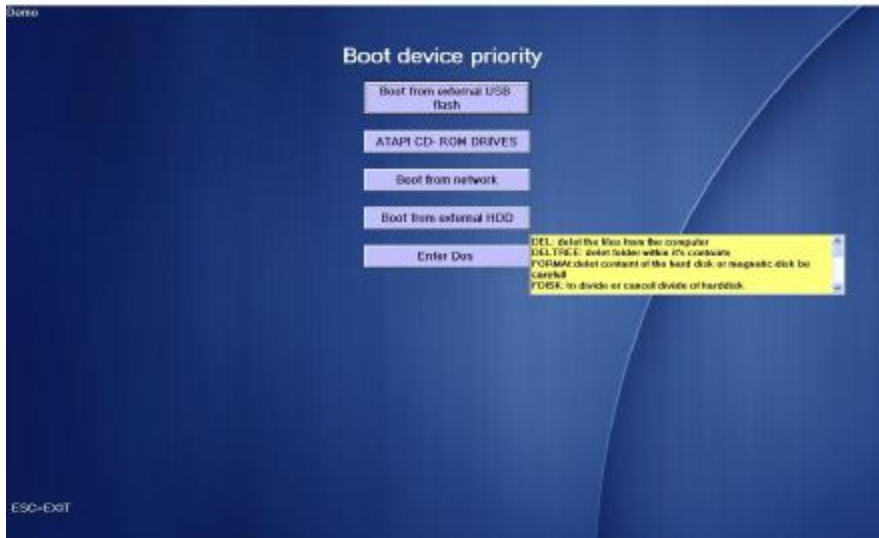


Figure (13) DOS help

### CONCLUSIONS

1. It can possible to add any function to this program and run because of flexibility of using the visual basic programming language in implementation.



2. Variation of the values configuration by using mouse only with implemented keyboard inside the program and without use computer keyboard.
3. Easy to teach the students the mean of BIOS and its functions.
4. It's possible to boot and access to DOS easily.
5. It's possible to protect the system and H.D.D. by passwords.

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