Storage of Management System

Project Report Submitted to the College of Science, Baghdad University in Partial Fulfillment of the Requirements for the BSC Degree of Science in Computer Science

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2011 - 2012
الإهداء

إلى من جرع الكأس فارغاً ليسقيني قطرة حب
إلى من كلّت أتانّه ليقدم لنا لحظة سعادة
والدي العزيز
إلى من أرضعتني الحب والحنان
إلى القلب الطاهر رمز الحب وبلسم الشفاء
والدتي الحبيبة
إلى من منحني المعرفة والعلم والنور
استاذي الفاضل

الآن تفتح الأشرعة وترفع المرساة لتنطلق السفينة في عرض بحر
واسع مظلم هو بحر الحياة وفي هذه الظلمة لا يضيء إلا قنديل
ذكرى الأخوة البعيدة إلى الذين أحبيبهم وأحبوني
أخدقائي
بِسْمِِلِلَّهِ الرَّحْمَٰنِ الرَّحِيمِ
الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ
الرَّحِيمِ
الرَّحِيمِ
مَالِكِ يَوْمِ الدِّينِ
إِيَّاكَ نَعْبُدُ وَإِيَّاكَ نَسْتَعِينَ
أَهِدْنَا الصِّرَاطَ الْمُسْتَقِيمَ
صِرَاطَ
الَّذِينَ آمَنُوا عِنْدَهُمْ عِبَارَة عِنْ
عَلَيْهِمْ وَلَا أُضَامَّ الْأَنَّ
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Chapter One

Introduction

1-1 Introduction:

It seems that storage systems are very important to maintain assets until it’s requested by other storages or warehouses, therefore the development of these systems is very important too.

This approach tries to design and implement storage system and management, using the modern technologies. These technologies represented by barcode reader usage through web.

Barcode reader is one of methods to develop the storage system and its management, because of its ease and appropriate volume. Before dealing with barcode reader, the assets in the storage must be coded; there is many coding ways, which described in the next chapter.

The purpose of using web is for adding a facility for dealing with storage system management through the World Wide Web. In other words, this management system can be used at any place has an internet service.

Web facility here would implemented by using ASP.NET with C# programming language through MS Visual Studio 2008, that deal with barcode reader in simplest way.
Chapter two

Storage Systems and its Development

1. Storage Responsibility:

Storage is responsible for maintaining the assets in adequate quantities until its requested in other storages or warehouses close to the position the main storage, with the importance of well storage method appropriate for the stored materials.

A. Keep different kinds of assets.
B. Items are kept in adequate quantities because:
   1- If the quantities were less than what should, subject the user to stop.
   2- If quantities greater than should, that will be increase the inventories and increase the cost of storage, and increased number of damaged items.
C. Retain the case of assets, as protect them from the damage or change the specifications during time and by providing the appropriate storage place for the stored materials.
D. Store the assets for a period of time, it's long or short depending on the need for these materials that are stored.
E. The storage is in places close to the point of use to avoid the risk of waiting.
F. Must provide the appropriate conditions for storage of lighting, ventilation, suitable employees, with the storage place that fit with the nature of the stored product, and means of handling inventory.
G. Must be in an appropriate manner of storage operations of receiving, checking, coding, exchange, handling, planning, and controls.
2. **Storage Goals:**

A. Provide the needs from the number of materials and equipment necessary for production.

B. Storage the finished products in case of safe and suitable for use.

C. Provide the necessary data for:
   
   1- Coordination between production plans, buying plans, marketing plans, capabilities and storage systems available.
   2- To calculate the cost of raw materials, supplies, and loaded on the stages of production.

D. Working to reduce the cost of storage and reduce the amount of capital invested in the asset inventory to as minimum as possible, taking care that the stored assets not decreased under the requirements.

E. Ensure that no loss or damage or theft for various items through the development of an accurate system for the receive, retain and disbursement of materials stored.
3- Storage System:

Resource → Inputs → Process → Outputs → Usage

Resource:
- Inside
- Outside

Inputs:
- Classes
- Facilities
- Equipments
- Employees
- Information
- Technologies

Process:
- Deliver
- Store
- Consumption
- Censorship

Outputs:
- Available for use
- Storage Cost
- Damaged Classes
- Obsolete Classes

Usage:
- Production Management
- Purchases Management
- Financial Management
- Distributors
4- Storage Management:

4-1 Delivery:

1- A copy of the purchase order issued to the supplier and there is another one for the Secretary of the storage area.

2- Review the quantities set for the purpose of making sure of the following:
   a. the quantity identical to the amount that released by the purchase order.
   b. Specifications: equivalent to the number, shape, and measurement of the request.
   c. Time: that the order is received at the specified time.
   d. Damaged or incomplete: a report is prepared to do so.

3- Recording incoming items.

4- Prepare a report of receiving and recording data of the variety, quantity, name of supplier, name of carrier.

4-2 Consumption:

1- The licensing authority certifying.

2- Identifying the needs of the items.

3- Method to consume items:
   a. Consumption on demand.
   b. Consumption according to production schedules.
   c. Regular consumption.
   d. Consumption according to the trust.
   e. Consumption according to the replacement.
   f. Consumption as borrowing.
   g. Consumption of items allocated.
4-3 Coding:

One of development methods of storage systems is adding the coding system, and uses the barcode reader. According to existence of many classes, we will try to coding them by symbols or numbers instead of description as the following:

1- Subject.
2- Parts.
3- Equipments.
4- Spare parts.
5- Tools.
6- General responsibilities.

4-3-1 Coding Benefits:

1- Avoiding sophisticated description.
2- Tiny determination.
3- Avoidance of replication.
4- Supporting buying activity.
5- Provide a source for registration.
6- Ease of consumption and delivery.

4-3-2 Coding systems:

1- Alphabetic system.
2- Numerical system.

4-3-3 Coding Methods:

1- Coding according to the nature of class.
2- Coding according to the nature of use.
3- Coding according to the nature of management.
4- Coding according to the nature of original class number.

4-3-4 Coding Properties:

1- Covering all stored items.
2- The symbols used are constant.
3- Allowing the future extends.
4- Unique code for each item.
5- Ease to understand.

4-3-5 coding should consist of:

1- Measurements.
2- Dimensions.
3- Weight.
4- Performance.
5- Other properties.
Chapter three

Approach Structure

Visual Studio:

Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop console and graphical user interface applications along with Windows Forms applications, web sites, web applications, and web services. Visual Studio supports different programming languages; one of these languages is C# which would be described in this chapter as one of approach's requirement.

Features:

1- Multi-Targeting support:

   Earlier, each Visual Studio release only supported a specific version of the .NET Framework. For example, VS 2003 only works with .NET 1.1, and VS 2005 only works with .NET 2.0, but VS 2008 support what Microsoft calls "Multi-Targeting". This means that Visual Studio will now support targeting multiple versions of the .NET Framework, and developers will be able to take advantage of the new features that Visual Studio provides without having to migrate their existing projects and deployed applications to use a new version of the .NET Framework.

2- Web Designer/Editor and CSS support:

   One feature that web developers will discover with VS 2008 is its drastically improved HTML designer, and the extensive CSS support made available.
3- **ASP.net support:**

ASP.NET and Visual Studio 2008 bring great new functionality around Web development and design that makes building standards based next generation websites easier than ever.

4- **Few Other Features and Enhancements:**

LINQ is a new feature that broadens great querying capabilities into the language syntax. LINQ introduces patterns for querying and updating data. A set of new assemblies are provided that enable the use of LINQ with collections and SQL databases.

**ASP.NET:**

ASP.NET (ASP stands for Active Server Pages) is a Web application framework developed and marketed by Microsoft to allow programmers to build dynamic Web sites, Web applications and Web services.

ASP.NET is a programming environment that gives the ability to generate dynamic html pages with the help of server side scripting. An ASP.NET page is almost the same as HTML page, the only difference is that an ASP page has the '.aspx' extension, and is normally written in VB.NET or C# (C sharp).

ASP.NET is a new ASP generation. It is not compatible with Classic ASP, but ASP.NET may include Classic ASP, and it's faster than Classic ASP. ASP.NET has better language support, a large set of user controls, XML-based components, and integrated user authentication.

**Extensions:**

1- Classic ASP files have the file extension '.asp'.
2- ASP.NET files have the file extension '.aspx'.
3- ASP.NET files with Razor C# syntax have the file extension '.cshtml'.
4- ASP.NET files with Razor VB syntax have the file extension '.vbhtml'.

Features:

1- Easy to learn, understand, and use.
2- Built around single web pages.
3- Similar to PHP and Classic ASP.
4- Server scripting with Visual Basic or C#.
5- Full HTML, CSS, and JavaScript control.

Complete Compatibility:

One of the most important goals of .NET was to allow developers to write an ASP.NET application using multiple programming languages. As long as each ASP.NET page contains only one programming language, you can mix and match different pages using different languages and they will work together seamlessly. This means you can now have a team of developers with half programming in C#, and the other half in VB.NET, with no need to worry about language incompatibilities ... etc.
C#:

C# (pronounced see sharp) is a multi-paradigm programming language encompassing strong typing, imperative, declarative, functional, generic, object-oriented (class-based), and component-oriented programming disciplines. It was developed by Microsoft within its .NET. C# is one of the programming languages designed for the Common Language Infrastructure.

**Design goals of C#:**

1- C# language is intended to be a simple, modern, general-purpose and object oriented programming language.
2- Provide support for software engineering principles such as strong type checking, array bounds checking and detection of attempts to use uninitialized variables.
3- The language is intended for use in developing software components suitable for deployment in distributed environments.
4- Source code portability is very important, as is programmer portability, especially for those programmers already familiar with C and C++.
5- Support for internationalization is very important.
6- C# is intended to be suitable for writing applications for both hosted and embedded systems, ranging from the very large that use sophisticated operating systems, down to the very small having dedicated functions.
7- Although C# applications are intended to be economical with regard to memory and processing power requirements, the language was not intended to compete directly on performance and size with C or assembly language.
Features:

1- It aims to combine the high productivity of Visual Basic and the raw power of C++.
2- It is a part of Microsoft Visual Studio, and visual studio supports VB, VC++, C++, Vbscript, and Jscript. All of these languages provide access to the Microsoft .NET platform.
3- Compatible with other .NET languages and .NET includes a common execution engine and a rich class library.
4- CLR (Common Language Run-time) accommodates more than one language such as C#, VB.NET, JavaScript, ASP.NET and C++.
5- The classes and data types are common to all of the .NET languages.
6- Development Console application, Windows application, and Web application using C#.
7- In C# Microsoft has taken care of C++ problems such as Memory management, pointers ... etc.
Web Database:

With the advent of Web database technology, Web pages are no longer static, but *dynamic* with connection to a back-end database. Web sites are now able to display updated information on-the-fly and support user interactivity. One can use the same page to display information of thousands of products in a database.

Common Usage:

A web database is a wide term for managing data online. A web database give an ability to build own databases/data storage without being a database guru or even a technical person.

Interactivity between User and Web DB:

1- From a Web browser, a user submits a request to the Web server.
2- The Web server passes it onto the middleware.
3- The middleware writes the request in SQL queries and sends it to a back-end database.
4- The data retrieved are handed back to the middleware.
5- The middleware generates a Web page for the data.
6- The Web server sends the Web page to the browser.
7- The browser displays the Web page to the user.

Web Database and ASP.NET Relationship:
To interact with a database, usually have to add code that talks to a particular database using a proprietary language.

SQL Server Compact is a database engine that facilitates ASP.NET Web development and deployment. It does not require a database server or service. Instead, copying the program files into the Bin directory of ASP.NET application. The database files are stored in the 'App_Data' folder of ASP.NET applications as '.sdf' files. An important property of SQL Server Compact, which it does not require an administrator account and migrates easily to SQL Server.
A barcode reader (or barcode scanner) is an electronic device for reading printed barcodes. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain decoder circuitry analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

In that approach, USB barcode used rather than other type, as this became a more convenient hardware option. To retain the easy integration with existing programs, a device driver called a "software wedge" could be used, to emulate the keyboard-impersonating behavior of the old "keyboard wedge" hardware.

1- Benefits:

- Portable in size and simple to use.
- Suitable for small businesses.
- Low maintenance.
- Less in price when compared to a laser gun or a CCD reader.
- Can be considered as the basic scanner.

2- Features:

The barcode scanners consist of an internal decoder and a cable, which are connected to the computer through compatible ports. It consists of a light source, a lens and a photo conductor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain decoder circuit. It analyzes the barcode's image data provided by the photo conductor and sends the barcode's content to the scanner's output port. Advanced readers use laser-scanning technology. Barcode readers are available in several forms like in hand-held, hands-free, wearable, scan engines, laser or digital.

3- Action:
Barcode scanners have a positive impact on both the commercial and

Industrial sector. In the commercial segment, the usage of barcode scanners has reduced the time and effort at the process of billing. In the industrial segment, the barcode scanners have a positive impact in many areas increasing operating efficiency and the productivity.

4- GTIN (Global Trade Item Number):

GS1 is an international not-for-profit association dedicated to the development and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across multiple sectors. The GS1 System of standards is the most widely used supply-chain standards system in the world.

GTIN is a term used to describe the entire family of GS1 data structures for trade items (products and services) identification. GTINs may be 8, 12, 13 or 14 digits long, and each of these 4 numbering structures are constructed in a similar fashion, combining Company Prefix, Item Reference and a calculated Check Digit.

5- POS (Point Of Sale):

Also sometimes referred to as Point of purchase (POP) or checkout is the location where a transaction occurs. A "checkout" refers to a POS terminal or more generally to the hardware and software used for checkouts, the equivalent of an electronic cash register. A POS terminal manages the selling process by a salesperson accessible interface. The same system allows the creation and printing of the receipt.

6- Barcode Types:

There are many types of barcode, as the following:
6-1 Barcode-14:

- 14-digit encoding.
- Used for GTIN – 8, 12, 13, 14
- Omni-directional scanning
- Can be used as POS

6-2 Barcode-14 Staked:

- 14-digit encoding.
- Used for GTIN – 8, 12, 13, 14
- Omni-directional scanning

6-3 Barcode-14 Extended:

- Maximum 74-numeric, 41-alphanumeric encoding.
- All GS1 Application Identifiers can be utilized.
- Omni-directional scanning
- Can be used as POS
- Used for new coupon

6-4 Barcode-14 Extended Stacked:

- Maximum 74-numeric, 41-alphanumeric encoding.
- All GS1 Application Identifiers can be utilized.
- Omni-directional scanning
- Can be used as POS
- Used for new coupon

6-5 Barcode-14 Limited:

- 14-digit encoding.
- Used for GTIN - 8,12,13,14
- Leading digit is always 0 or 1
- Is not used at POS
6-6 Barcode-14 Truncated:

- 14-digit encoding.
- Used for GTIN - 8,12,13,14
- Is not used at POS

6-7 Barcode-14 Stacked:

- 14-digit encoding.
- Used for GTIN - 8,12,13,14
- Leading digit is always 0 or 1
- Is not used at POS
Chapter Five
Practical Part

1- Login Phase:

The admin can login to the system though type username and password in the textboxes bellow. The default username is "admin" and password is also "admin". When insert that information the supervisor will login and redirected into the next phase of controlling the Storage and management system.

protected void login(object sender, EventArgs e)
{
if (t1.Text.Equals("admin"))
{
    if (t2.Text.Equals("admin"))
    {
        Response.Redirect("Mainmenu.aspx");
    }
    else { Response.Write("<script>alert('عذراً، كلمة السر أو اسم المستخدم غير صحيح');</script>");
    t1.Text = "";
    t2.Text = "";
    }
}
else { Response.Write("<script>alert('عذراً، كلمة السر أو اسم المستخدم غير صحيح');</script>");
}
2- Controlling Phase:

The administrator now logged in, and the phase below is appear instead of the previous one. As the shot shown below, the administrator can do:

Main Phase

```csharp
protected void b6_Click(object sender, EventArgs e)
{
    Response.Redirect("login.aspx");
}
protected void b5_Click(object sender, EventArgs e)
{
    Response.Redirect("Table.aspx");
}
protected void b1_Click(object sender, EventArgs e)
{
    Response.Redirect("insert.aspx");
}
protected void b2_Click(object sender, EventArgs e)
{
    Response.Redirect("Search.aspx");
}
protected void b3_Click(object sender, EventArgs e)
{
    Response.Redirect("Update.aspx");
}
protected void b4_Click(object sender, EventArgs e)
{
```
2-1 Insert Phase:

To insert new item to the system, the first button of main phase will being chosen. The next phase will appear. As shown in the insertion phase, the administrator fill the textboxes as the information needed.

protected void insert(object sender, EventArgs e)
{
    SqlConnection con = new SqlConnection("Data Source=.\sqlExpress;Initial Catalog=search;Integrated Security=True");
    con.Open();
    SqlCommand cmd = new SqlCommand();
    SqlCommand cmd1 = new SqlCommand();
    cmd.Connection = con;
    cmd.CommandText = string.Format("insert into tbsearch values ('{0}','{1}','{2}','{3}','{4}','{5}','{6}','{7}','{8}','{9}'),
    cmd.ExecuteNonQuery();
    con.Close();
    emptyTxt();
    Response.Write("<script>alert('القيد ادخال تم');</script>");
}

2-2 Search Phase:
To search for an item, the second button of the main phase will being chosen. The phase() will appear. The item which wanted to search for, its barcode number or serial number will typed into the main textbox, the two check boxes under the main textbox will determine if the number entered is barcode or serial. All information about the item whose number entered will be displayed inside other textboxes.

```
protected void search(object sender, EventArgs e)
{
    emptyTxt();
    visObj();
    SqlConnection con = new SqlConnection("Data Source=.;\sqlexpress;Initial Catalog=search;Integrated Security=True");
    con.Open();
    SqlCommand cmd = new SqlCommand();
    cmd.Connection = con;
    if (RadioButton1.Checked.Equals(true))
        cmd.CommandText = string.Format("select * from tbsearch where itembarcod='{0}'", tid.Text);
    else if (RadioButton2.Checked.Equals(true))
        cmd.CommandText = string.Format("select * from tbsearch where itemtype='{0}'", tid.Text);
    SqlDataReader buffer = cmd.ExecuteReader();
    if (buffer.Read())
    {
        t1.Text = buffer.GetValue(0).ToString();
        t2.Text = buffer.GetValue(1).ToString();
        t3.Text = buffer.GetValue(2).ToString();
        t4.Text = buffer.GetValue(3).ToString();
        t5.Text = buffer.GetValue(4).ToString();
        t6.Text = buffer.GetValue(5).ToString();
        t7.Text = buffer.GetValue(6).ToString();
    }
}
```
protected void update(object sender, EventArgs e)
{
    visObj();
    SqlConnection con = new SqlConnection("Data Source=.\sqlexpress;Initial Catalog=search;Integrated Security=True");
    con.Open();
    SqlCommand cmd = new SqlCommand();
    cmd.Connection = con;
}

2-3 Update Phase:

If the administrator wanted to update any data, the third button of the main phase will being chosen. As mentioned previously in search section, barcode or serial number inserted in main textbox then search about it. When the information about selected item is appeared in textboxes, the administrator can change any data of textboxes then click the button which responsible for updating.
cmd.CommandText = String.Format("update tbsearch set
itemtype='{0}',officename='{1}',itemcostd='{2}',itemcostf='{3}',itemquan='{4}',itemsource='{5}',itemdate='{6}',itemiddate='{7}',itemid='{8}',itembarcode='{9}' where
itembarcode='{10}'", t2.Text.Trim(), t3.Text.Trim(),
t7.Text.Trim(), t8.Text.Trim(),
t11.Text.Trim());
cmd.ExecuteNonQuery();
con.Close();
Response.Write("<script>alert('القيد تحديث تم');</script>"};

2-4 Deleting Phase:

If the administrator wanted to delete any item, the forth button
of the main phase will be chosen. As in search operation, the admin
search for item which is desire to delete. If the button that resonsible
for deletion clicked, the item will deleted.

2-5 View Table Phase:

For viewing database table, the fifth of the main phase button will
being chosen. All information about all itemes will be viewed.
For typing a report of any item, the sixth button of the main phase will be chosen. The item specified though insert th id of item desired, then clicking the button that resposible for printing. If any information wanted to be exported to another applocation (MS office, Adobe reader, .. etc) , the button that reponsible for exporting clicked, and If any information wanted to be printed, the button that reponsible for printing clicked.
3- Logout:

When the administrator finish his operations, he can log out of system through choosing the button that responsible for logging out (in the main phase).
Chapter Six
Conclusions and Future Works

Conclusions:

1- Using web technology to represent the storage system is better than using .exe application, because of the facility of web browsing from any place has an internet service.
2- Adding code for all assets in storage give the ability to use barcode reader, which is easier than deal with storages without coding.
3- C# language is intended to be a simple, modern, general-purpose and object oriented programming language and regard to memory and processing power requirements.
4- SQL Server is simplest ever to deal with interfaces, and has more secured for retaining data.
5- In updating operation, the WHERE condition base on the value of textbox which responsible for barcode, because other textboxes may be modified, while the barcode don’t able to modify and it is unique.
6- Barcode reader avoiding the problem of inserting data through typing.
7- Using ASP.NET with GUls that friendly with users will reduce the time of learning the system.

Future Works:

Some ideas may be added to this project, such as, there is more than one administrator managing the system, adding images of assets stored, creating a barcode label instead of using a standard barcodes, uploading the data base on the world wide web, and adding an ability to the customer to view the data of items in storage, to know whether them request is available or not.
References