

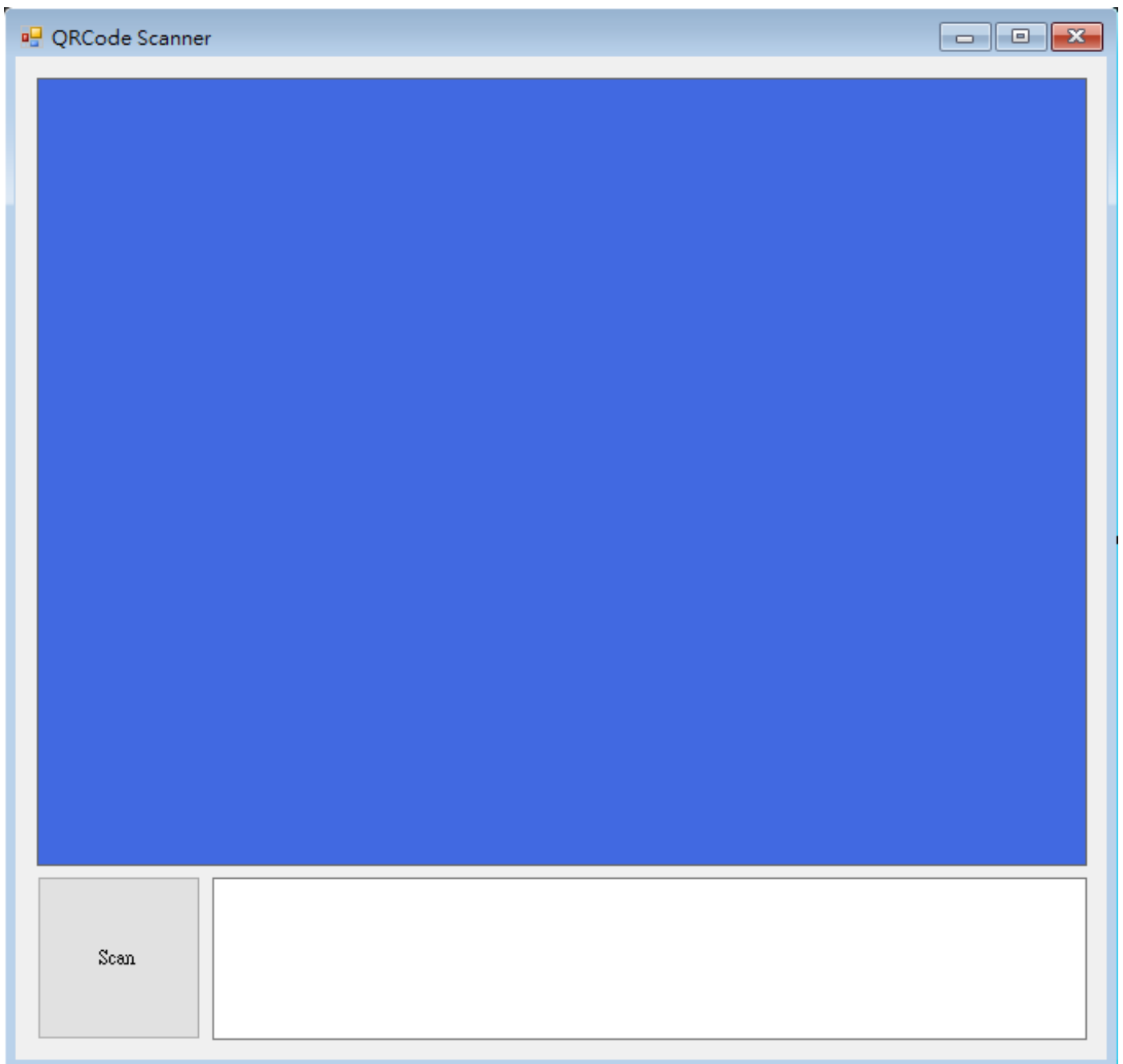
## QR 碼掃描器

QR 碼掃描器使用攝影機取得影像，掃描商品上的 QR 碼，取得商品的編號，在資料庫中取得資訊。使用 VB 程式語言和兩個函示庫：

- EMGU.CV（攝影機影像）
- ZXing.Net（QR 碼解讀）

## 程式表單

程式表單包含三個元件：PictureBox 用於顯示攝影機影像、Button 用於啟動掃描器、TextBox 用於顯示商品資訊、Timer 用於重複取得相機影像掃描影像。



# 攝影機

取得攝影機影像使用 EMGU.CV 這個函示庫，啟動攝影機只需定義新的 VideoCapture 變數：

```
Dim cap As New VideoCapture
```

取的攝影機影像並將影像顯示在 PictureBox 上：

```
PictureBox1.Image = cap.QueryFrame.Bitmap()
```

# QR 碼掃描

掃描 QR 碼使用 ZXing.Net 這個函示庫，先定義解碼器 BarcodeReader：

```
Dim barcodeReader As New BarcodeReader
```

解碼攝影機影像取得結果：

```
Dim result As Result = barcodeReader.Decode(PictureBox1.Image)
If result IsNot Nothing Then
    Timer1.Enabled = False
    Dim decoded As String = result.ToString().Trim()
End If
```

# 商品資訊

將商品資訊儲存於 CSV 檔案中，檔案內容格式如下：

```
0001,台灣啤酒,50
0002,長壽香菸,60
0003,可口可樂,30
0004,品客洋芋片,55
0005,麥香奶茶,10
```

每一行為一個商品，商品資訊以逗號隔開，商品資訊包含：編號、名稱和價格。

讀取商品資訊檔案以每次讀取一行檔案，再以逗號分隔取得各個資訊；分別將商品的兩資訊儲存至兩個清單 Dictionary 裡，Dictionary 是一個由鍵（key，商品編號）和值（value，商品名稱和價格）

組成的清單：

```
Dim nameList As New Dictionary(Of String, String)
Dim priceList As New Dictionary(Of String, String)

Dim streamReader As IO.StreamReader = My.Computer.FileSystem.OpenTextFileReader(".\\products.csv")
Dim line As String
Do
    line = streamReader.ReadLine()
    If line Is Nothing Then Exit Do

    Dim splitLine As String() = line.Split(",")
    Dim id As String = splitLine(0)
    Dim name As String = splitLine(1)
    Dim price As String = splitLine(2)
    nameList.Add(id, name)
    priceList.Add(id, price)
Loop
```

透過 QR 碼掃描的結果，將商品資訊顯示於 TextBox 上：

```
If nameList.ContainsKey(decoded) Then
    Try
        TextBox1.Text = "商品: " + nameList.Item(decoded) + vbCrLf + "價格: $" + priceList.Item(decoded)
    Catch ex As Exception
        MsgBox(ex.Message)
    End Try
Else
    TextBox1.Text = "查無此商品"
End If
```

## 主程式

主程式執行開始時須先載入商品資訊，VB 的程式表單執行開始時載入會觸發 Form1\_Load 功能，在這個功能中讀取商品資訊檔案：

```
Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load
    Dim streamReader As IO.StreamReader = My.Computer.FileSystem.OpenTextFileReader(".\\products.csv")
    Dim line As String
    Do
```

```

        line = streamReader.ReadLine()
        If line Is Nothing Then Exit Do

        Dim splitLine As String() = line.Split(",")
        Dim id As String = splitLine(0)
        Dim name As String = splitLine(1)
        Dim price As String = splitLine(2)
        nameList.Add(id, name)
        priceList.Add(id, price)

    Loop
End Sub

```

主程式需反覆掃描直到讀取到 QR 碼需要使用 Timer 這個元件，Timer 為一個時間觸發元件，在設定的毫秒時間格會觸發對應的程式。

按下掃描按鈕會觸發 Button1\_Click 功能，在這個功能中設定 Timer 觸發頻率並開啟 Timer：

```

Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
    TextBox1.Text = ""
    Timer1.Interval = 100
    Timer1.Enabled = True
End Sub

```

這邊設定 Timer 頻率為 100 毫秒，每 100 毫秒會觸發 Timer1\_Tick 功能，在每次的觸發中取得攝影機影像並掃描 QR 碼，如果取得 QR 碼解碼結果，停止 Timer 並顯示商品資訊：

```

Private Sub Timer1_Tick(sender As Object, e As EventArgs) Handles Timer1.Tick
    Try
        PictureBox1.Image = cap.QueryFrame.Bitmap()
    Catch ex As Exception
        MsgBox(ex.Message)
    End Try

    Dim result As Result = barcodeReader.Decode(PictureBox1.Image)
    If result IsNot Nothing Then
        Timer1.Enabled = False
        Dim decoded As String = result.ToString().Trim()
        If nameList.ContainsKey(decoded) Then
            Try
                TextBox1.Text = "商品: " + nameList.Item(decoded) + vbCrLf + "價格: $" + priceList.Item(decoded)
            Catch ex As Exception
                MsgBox(ex.Message)
            End Try
        End If
    End If
End Sub

```

```
        End Try
    Else
        TextBox1.Text = "查無此商品"
    End If
End If
End Sub
```

## 程式碼

```
Imports Emgu.CV
Imports ZXing

Public Class Form1

    Dim cap As New VideoCapture
    Dim barcodeReader As New BarcodeReader
    Dim nameList As New Dictionary(Of String, String)
    Dim priceList As New Dictionary(Of String, String)

    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        Dim streamReader As IO.StreamReader = My.Computer.FileSystem.OpenTextFileReader(".\\products.csv")
        Dim line As String
        Do
            line = streamReader.ReadLine()
            If line Is Nothing Then Exit Do

            Dim splitLine As String() = line.Split(",")
            Dim id As String = splitLine(0)
            Dim name As String = splitLine(1)
            Dim price As String = splitLine(2)
            nameList.Add(id, name)
            priceList.Add(id, price)
        Loop
    End Sub

    Private Sub Timer1_Tick(sender As Object, e As EventArgs) Handles Timer1.Tick
        Try
            PictureBox1.Image = cap.QueryFrame.Bitmap()
        Catch ex As Exception
        End Try
    End Sub
```

```
        MsgBox(ex.Message)
    End Try

    Dim result As Result = barcodeReader.Decode(PictureBox1.Image)
    If result IsNot Nothing Then
        Timer1.Enabled = False
        Dim decoded As String = result.ToString().Trim()
        If nameList.ContainsKey(decoded) Then
            Try
                TextBox1.Text = "商品: " + nameList.Item(decoded) + vbCrLf + "價格: $" + priceList.Item(decoded)
            Catch ex As Exception
                MsgBox(ex.Message)
            End Try
        Else
            TextBox1.Text = "查無此商品"
        End If
    End If
End Sub

Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
    TextBox1.Text = ""
    Timer1.Interval = 100
    Timer1.Enabled = True
End Sub
End Class
```