Inventory Application with Average Perpetual System By using Visual Basic 2015

(Case Study: UD Makmur: Indonesia)

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Abstract

The purpose of this paper is to explain how to develop an inventory computer application using the average cost method determined by PSAK (Indonesian General Accepted Accounting Principles) No.14. This application is a windows based application developed by using Visual Basic 2015 and SQL Server 2014. The table relationship established for the application follows the rule of normalization called 3rd Normal Form.

There were three steps that outline the research method employed by this paper i.e. analysing the current system, designing the recommended system, and applying the system design by developing the application.

The company, called UD. Makmur, currently still adopted the last purchase approach to determine the cost of product sold to their customer. This approach is inappropriate according to the Indonesian GAAP No.14. There are two appropriate ways of valuing the inventory in accordance with the standard i.e. First in First out (FIFO) and Average Methods. Furthermore, the company had to count manually in order to know the inventory balance in a certain period.. This way is really inefficient and may also result physical risk

By using the application developed through the research, the company can not only reduce both physical and financial risks, but also decrease the inefficiency in managing its inventory. Moreover, the inventory uses average method to inventory value, so the calculation has been compliance with the Indonesian GAAP (PSAK) No.14.

Keywords: Computer Application; Inventory; PSAK 14; Perpetual; Visual Basic

1 INTRODUCTION

Inventories are assets: (a) immediately ready for sale; (B) resold after undergoing some production processes; or (c) in the form of materials or equipment in the production process or providing services [1].

Inventories are included in current assets category that have a high enough risk in corporate activities if not addressed properly. Risks that may arise can be either physical risk or financial risk.

In terms of physical risk, the risks may include the fraud against existing inventory in the warehouse due to lack of supervision and damage of goods.

In the terms of financial risk, the inaccuracy of financial reporting may arise when the recording of inventory transaction is not addressed properly.

Having a high transaction volume, then the computer application program cannot be avoided to minimize both risks above.

This research paper explains technically and briefly how to develop an inventory application program for a company namely UD MAHFUZH AMIN located in Banjarbaru, Indonesia.

2 RESEARCH PROBLEM

Currently, UD MAHFUZH AMIN didn't record its inventory transactions (In and out) by using a computer application. It means in order to know the stock quantity, the company has to calculate manually and physically all inventory items.

To determine its inventory value, the company adopted the method of last purchase price. This

method is not appropriate according to the Indonesian GAAP (PSAK No.14 Revised 2008).

There are two methods that can be adopted by the company in order to determine its inventory value i.e First in First out (FIFO) and Average methods

3 RESEARCH AIM AND BENEFITS

Research aim and objectives are interrelated. The aim is what this research wants to achieve, and the objective describes how this research achieves that aim. An aim is a general statement, which reflects the intention or purpose of the area of this research, while an objective is a specific statement relating to the defined aim of this research.

3.1 RESEARCH AIM

The aim that this research wants to achieve is to develop an inventory application which can produce inventory card for each inventory item by using average method in perpetual inventory system.

3.2 RESEARCH OBJECTIVES

The research objectives are what this research wants to conduct in order to achieve the research aim above, i.e.:

1. To develop the user application (front end) by using Microsoft Visual Basic 2015
2. To develop database (back end) for the application. The table relationship of this database refers to 3th Normalisation Form (3NF). Microsoft SQL Server 2014 was used to develop the database.

4 RESEARCH METHODS

Research method is a procedure to find the required data to draw conclusion or make some predictable results In other words, research method is a way of collecting inputs and finding the outputs.

The following steps outline research method employed by this paper:

1. To analysis the current system. In this stage the weaknesses or limitations of the current system were identified.
2. To design the recommended system in order to patch the weakness of the current system that had been identified in the analysis stage. This weakness has been explained previously in the chapter of research problem.
3. To implement the design by developing the application using Visual Basic 2015.

5 LITERATURE REVIEW

5.1 Inventory Costing Methods

There are two methods of inventory costing i.e. the periodic system and perpetual system [2]. In the perpetual system, the inventory balance will be tracked continuously; whereas in the periodic system, the balance will be counted physically at the end of a certain period.

The application developed in this research adopt the perpetual system, so the company can track the inventory balance for every transaction related to the inventory.

5.2 Normalization Defined

Normalization is defined as the elimination of redundancies form an entity [3]. There are three forms of normalization i.e. 1St Normal Form, 2nd Normal Form, and 3rd Normal Form (NF).

This application's table relationship is tested for the compliance with the 3rd NF. It means that there are no:

- Dependencies on non-key attributes (3NF)
- Partial Dependencies on a concatenated key (2NF)
- No repeating elements or repeating groups (1NF)

5.3 Visual Basic 2015

Visual Basic 2015 is Microsoft's latest version of the highly popular Visual Basic .NET programming language, one of the many languages supported in Visual Studio 2015 [4]

5.4 SQL Server 2014

Microsoft SQL Server is the database application software offered for Windows servers from Microsoft [5]. It is a relational database management system (RDBMS), which means that it supports databases including schemas, tables, and data records.

6 DISCUSSIONS

This chapter discuses about table relationship of the database, the algorithm logic of average calculation, and the Visual Basic coding used to implement the logic.

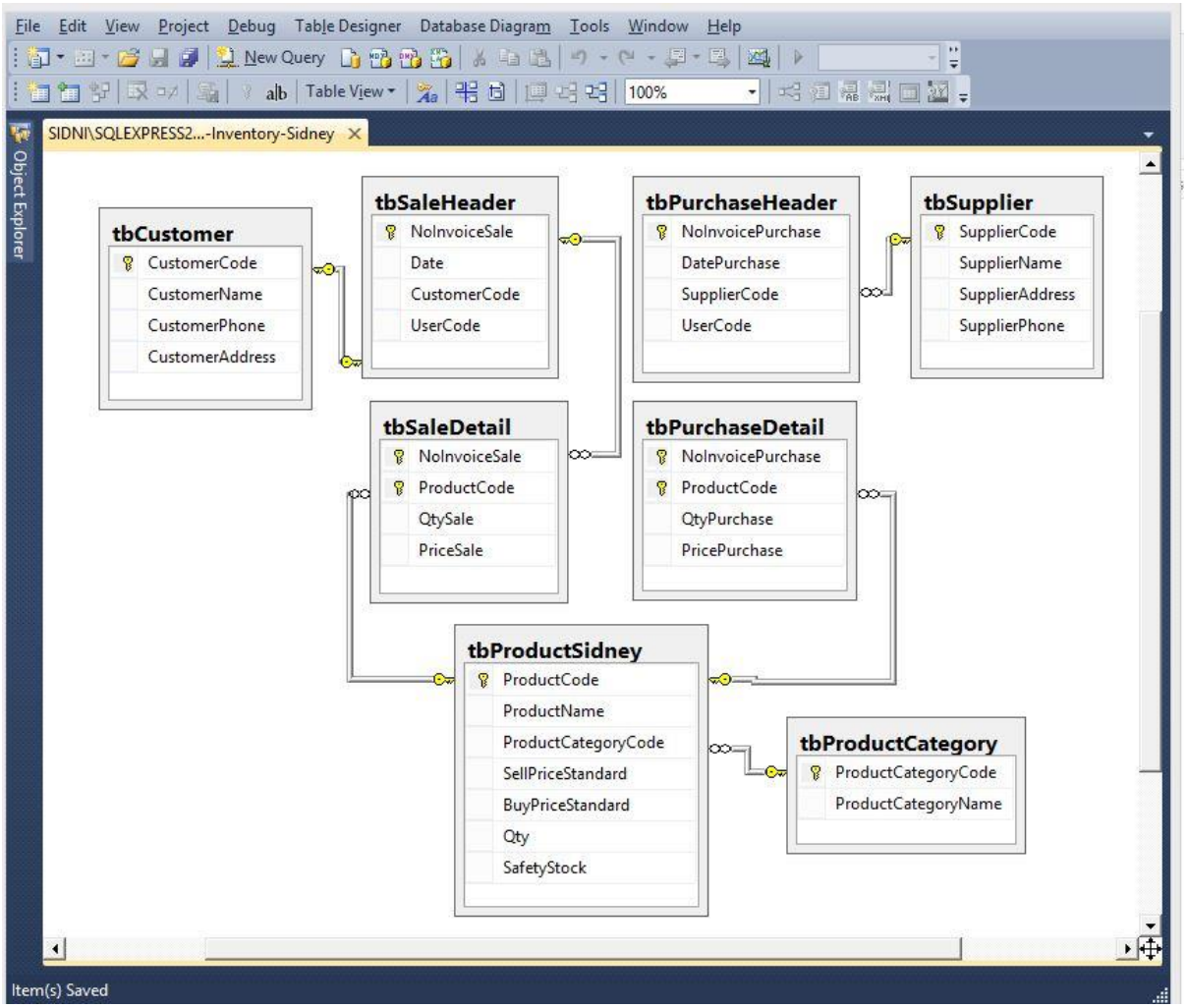
6.1 Interfaces

There are three interfaces essential to be discussed i.e. Purchase Form, Sales Form, and the form for displaying the inventory stock. The third form is illustrated at the following figure:

The event of On Click on the control button namely “btnDisplay” will calculate the cost of purchase using average method.

6.2 Table Relationship

The following figure shows how the relationship of all tables needed by this application. This relationship follows the rule of the 3rd Normal Form of Normalization:



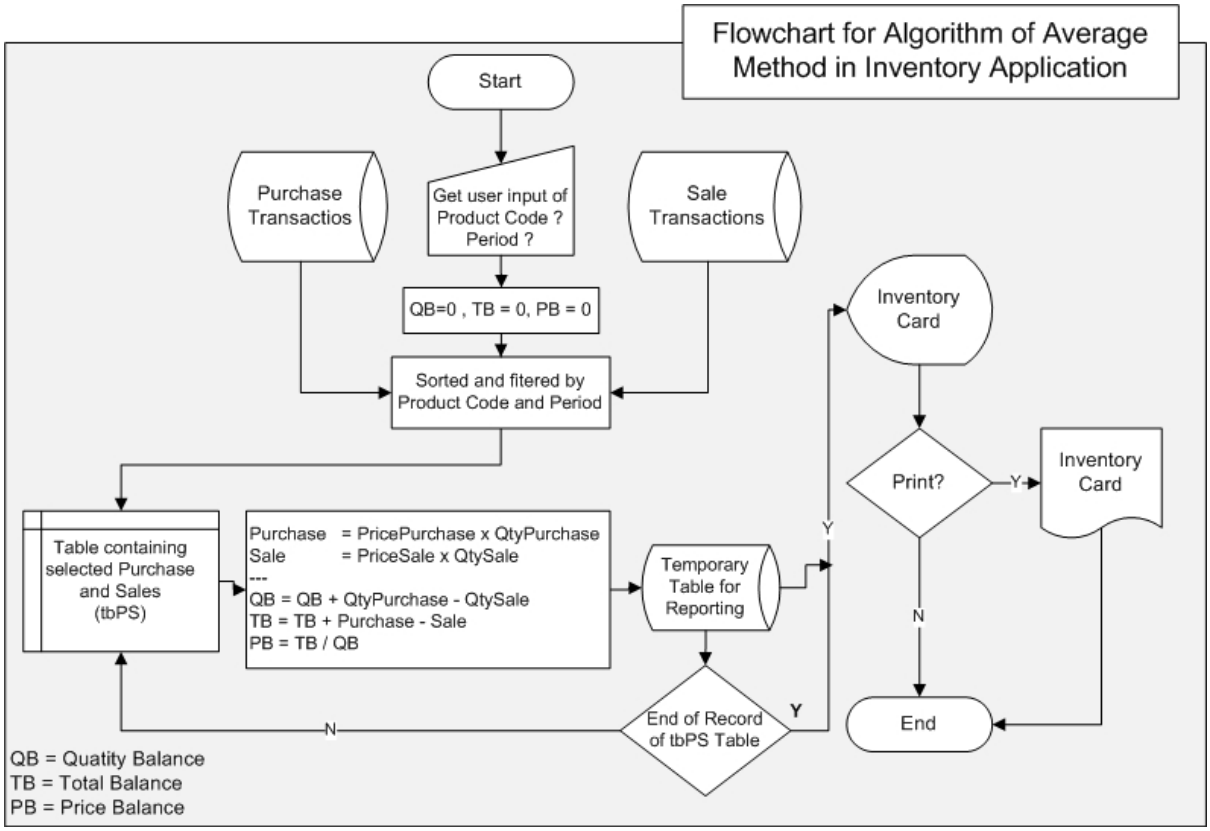
6.3 Inventory Card

The following picture shows the inventory card of “Conch Cement 50kg”. The card is produced by the application:

Inventory Card
Conch Cement 50Kg
From '01/03/2016 to 04/03/2016

Date	Description	Purchase			Sale			Balance		
		Qty	Price	Total	Qty	Price	Total	Qty	Price	Total
01/03/2016	Beginning Balance							23	48,183	1,108,209
02/03/2016	Sale	-	-	-	3	48,183	144,549	20	48,183	963,660
03/03/2016	Sale	-	-	-	3	48,183	144,549	17	48,183	819,111
04/03/2016	Sale	-	-	-	7	48,183	337,281	10	48,183	481,830
04/03/2016	Sale	100	48,200	4,820,000	-	-	-	110	48,198	5,301,830

6.4 Algorithm for Average Method in inventory Perpetual System



6.5 Coding

6.5.1 Variables Declaration

```
Private Sub CalculateAverage()
'Variables
Dim dtmDateTrans As Date
Dim intQtyPurchase, intPricePurchase, TotalPurchase,
    intQtySale, decPriceSale, decTotalSale,
    QB, PB, TB,
    intQtySale2, decPriceSale2,
    decTotalSale2 As Decimal
Dim strProductCode, strProductName, TransactionType As String
Dim intNo As Integer

Dim dtPurchase As New DataTable
Dim dtSale As New DataTable

'Delete the temporary table
tbInventoryCardTableAdapter.DeleteQueryInventoryCard()
tbSalePurchaseTableAdapter.DeleteQuerySalePurchase()

'Sorting by Date dan Transaction Type
Me.tbSalePurchaseTableAdapter.FillByUrutDateandTransaction
   (Me.ProgramUDMahfuzhAminInventoryDataSet.tbSalePurchase)

dtSale = ViewSaleGabungTableAdapter.
         GetDataByProductNameSale(ComboBoxProductName.Text.Trim)
dtPurchase = ViewPurchaseGabungTableAdapter.
             GetDataByProductNamePurchase(ComboBoxProductName.Text.Trim)

==================================
```

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6.5.2 Get transaction data from purchase and sale transactions in a chosen period

```
For N = 0 To dtPurchase.Rows.Count - 1
    QB = 0
    PB = 0
    TB = 0
    'Get from  View Purchase
    dtmDateTrans = dtPurchase.Rows(N).Item("DatePurchase")
    strProductCode = dtPurchase.Rows(N).Item("ProductCode")
    strProductName = dtPurchase.Rows(N).Item("ProductName")
    intQtyPurchase = dtPurchase.Rows(N).Item("qtyPurchase")
    intPricePurchase = dtPurchase.Rows(N).Item("PricePurchase")
    TotalPurchase = intQtyPurchase * intPricePurchase
    TransactionType = "Purchase"
    tbSalePurchaseTableAdapter.InsertQuerySalePurchase(TransactionType,
      strProductCode, strProductName, dtmDateTrans,
      intQtyPurchase, intPricePurchase)
Next
For N = 0 To dtSale.Rows.Count - 1
    QB = 0 PB = 0 TB = 0
    'Get From View Sale
    dtmDateTrans = dtSale.Rows(N).Item("Date")
    strProductCode = dtSale.Rows(N).Item("ProductCode")
    strProductName = dtSale.Rows(N).Item("ProductName")
    intQtySale = dtSale.Rows(N).Item("qtySale")
    decPriceSale = dtSale.Rows(N).Item("PriceSale")
    decTotalSale = intQtySale * decPriceSale
    intQtySale2 = dtSale.Rows(N).Item("qtySale")
    decPriceSale2 = dtSale.Rows(N).Item("PriceSale")
    decTotalSale2 = intQtySale2 * decPriceSale2
    TransactionType = "Sale"
    tbSalePurchaseTableAdapter.InsertQuerySalePurchase(TransactionType,
      strProductCode, strProductName, dtmDateTrans, intQtySale, decPriceSale)
Next
============
```

6.5.3 Insert transaction data into a temporary table for reporting the inventory card

```
61  ============
62  Sorting tbSalePurchase based on Date and Transaction Type
63  Me.tbSalePurchaseTableAdapter.FillByUrutDateandTransaction(
64  Me.ProgramUDMahfuzhAminInventoryDataSet.tbSalePurchase)
65  Dim DT As New DataTable
66  DT = tbSalePurchaseTableAdapter.GetDataByUrutDateandTransaction
67  intNo = 2
68  For p = 0 To DT.Rows.Count - 1
69      'Get from temporary table SalePurchase
70      TransactionType = DT.Rows(p).Item("JenisTransaksi")
71      dtmDateTrans = DT.Rows(p).Item("DateSalePurchase")
72      strProductCode = DT.Rows(p).Item("ProductCode")
73      strProductName = DT.Rows(p).Item("ProductName")
74      'Insert to temporaryTabel InvetoryCard
75      If TransactionType = "Purchase" Then
76          intQtySale = 0 decPriceSale = 0 decTotalSale = 0
77          intQtySale2 = 0 decPriceSale2 = 0 decTotalSale2 = 0
78          intQtyPurchase = DT.Rows(p).Item("qtySalePurchase")
79          intPricePurchase = DT.Rows(p).Item("PriceSalePurchase")
80          TotalPurchase = intQtyPurchase * intPricePurchase
81          QB = QB + intQtyPurchase    TB = TB + TotalPurchase    PB = TB / QB
82      Else
83          intQtyPurchase = 0 intPricePurchase = 0 TotalPurchase = 0
84          intQtySale = DT.Rows(p).Item("qtySalePurchase")
85          ' this is cost of good sold
86          decPriceSale = PB
87          decTotalSale = intQtySale * decPriceSale
88          'For record sales
89          intQtySale2 = DT.Rows(p).Item("qtySalePurchase")
90          decPriceSale2 = DT.Rows(p).Item("PriceSalePurchase")
91          decTotalSale2 = intQtySale2 * decPriceSale2
92          QB = QB - intQtySale
93          TB = TB - decTotalSale
94          'PB = TB / QB
95      End If
96      tbInventoryCardTableAdapter.
97        InsertQueryInventoryCard(intNo, TransactionType,
98          strProductCode, strProductName, intQtyPurchase, intPricePurchase, TotalPurchase,
99          intQtySale, decPriceSale, decTotalSale,
100         QB, PB, TB, dtmDateTrans, decPriceSale2, decTotalSale2, intQtySale2)
101     intNo = intNo + 1
102 Next
```

7 CONCLUSION and RECOMMENDATION

1. The company had better use an inventory application to track its inventory related transactions such as purchase, sale and sale/purchase return.

2. The computerized perpetual inventory system explained in this paper is very useful to the company in controlling and managing its inventory.

3. The application should follow the calculation method of cost of goods sold determined by PSAK No.14 (Indonesian GAAP).

4. The table relationship used for the application should for follow the 3rd Normal Form or BNCF

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