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DEVELOPING AN INVENTORY  
AND  
CONTROL SYSTEM  
FOR BEIRUT UNIVERSITY COLLEGE

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A Research Topic  
Presented to Business Division  
Beirut University College

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Business  
Management

by  
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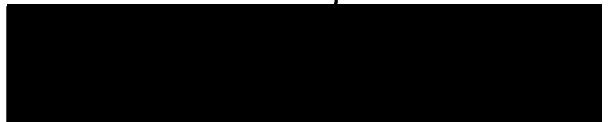
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TITLE OF RESEARCH TOPIC DEVELOPING AN INVENTORY AND CONTROL SYSTEM FOR  
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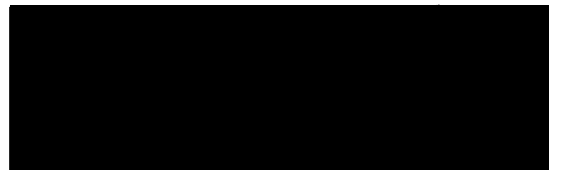
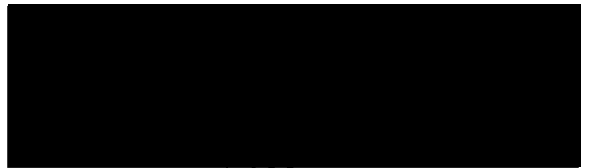
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## LIST OF TABLES

<u>TABLE</u>		<u>PAGE</u>
I	Growth in Students, Faculty and Purchases at B.U.C.	16
II	Comparison of the Pricing Methods	67
III	Identifying the Economic Order Quantity	70

## LIST OF FIGURES

<u>FIGURE</u>		<u>PAGE</u>
1	The Purchase Order	9
2	The Purchase Requisition	10
3	The Stationery & Supplies - Requisition Form	11
4	The Stock Card	12
5	The Receiving Report	51
6	The Consumption Order of Items from Stores	53
7	The Consumption Permission Form	52
8	The Consumption Journal	55
9	The Purchase Journal	56
10	The Proposed Organization Chart of the Inventory Department	48

## TABLE OF CONTENTS

<b>CHAPTER I</b>	<b>THE PRESENT SYSTEM AT B.U.C.: PROBLEMS, NEEDS AND PURPOSE OF STUDY</b>	
	Introduction	1
	Description of the Existing System	3
	The Purchasing Department	3
	The Purchases	3
	The Purchasing Subsystem	3
	The Inventory System	5
	Description of the Post Office	5
	The Personnel	6
	The Documents	6
	The System of the Inventory	8
	The Problem of the System	14
	The Need for the Study	15
	The Purpose of the Study	17
<b>CHAPTER II</b>	<b>STANDARDS OF PROCEDURES FOR INVENTORY CONTROL</b>	
	Theoretical Procedures for Control	19
	People	19
	Space	20
	Items	21
	Records	22
	Inventory	23
	Control Procedures Being Practiced at Various Other Institutions	23
	NEST	24
	The American University of Beirut	24
	Beirut Arab University	25
	The Al-Madina Bank	27
<b>CHAPTER III</b>	<b>THE OPERATION IN THEORY: FACILITY, PERSONNEL, RECORDS, PRICING AND BASIC INVENTORY DECISIONS</b>	
	The Choice of the Facility	30
	The Organization Chart of the Inventory Department	30
	The Design of Records	31

Various Pricing Methods	34
The First-in, First-out Method	36
The Weighted Average Method	37
The Last-in, First-out Method	39
The Specific Identification Method	40
The Basic Inventory Decisions	41
Optimum Number of Units Per Order	42
The Cost of Ordering	42
The Carrying Costs	43
The Reorder Point	43
Lead Time	44
Cost of Out-of Stock	44
Safety Stock	44
CHAPTER IV. DESIGNING AN OPTIMAL INVENTORY SYSTEM FOR B.U.C.:	
<del>FACILITY, PERSONNEL, RECORDS, PRICING AND ORDERING</del>	
<hr/>	
The Choice of the Facility	45
The Organization Chart of the Proposed Inventory Department	47
The Additional Documents to be Used by the Various Departments	49
Application of the Pricing Methods and Comparison	54
Application of the Basic Inventory Decisions	68
CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS	71
BIBLIOGRAPHY	74

## CHAPTER I

### THE PRESENT SYSTEM AT B.U.C.: PROBLEMS, NEEDS, AND PURPOSE OF STUDY

#### Introduction

Change is central to Beirut University College which as a non-profit institution has gone through many alterations in its structure from 1835 to the present day.

In 1835, in the Turkish empire, the college was just an American School for girls. Then in 1927 after the introduction of a two-year program to the high school it was transferred to Ras Beirut as a separate institution under the name of American Junior College for Women. In 1950, the college was expanded to university level under the new name of Beirut College for Women and was located in Madame Curie Street. In 1973 the name of the college was changed again to Beirut University College, and in 1975 men were admitted to all majors offered at the college.<sup>1</sup>

Today, eight buildings surround the central campus and Beirut University College looks to future growth and expansion and further change. Along with the increasing number of students, staff and faculty comes the increasing volume of its numerous purchases. These vary mainly from equipment and furniture to detergent and sanitation supplies, chemical apparatus, electrical, plumbing and carpentry supplies, stationery and office supply. But not all these purchases

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<sup>1</sup>Beirut University College, Academic Catalog, 1980-1982, pp.5-6.



are included in the inventory. Except for the stationery and office supplies, huge lots of other items have been ordered and stored some place to be buried for years and ordered twice. All this has happened because of the lack of control on all items. There has been no system to keep track of these materials or assets. For this reason, the idea of establishing a centralized system has emerged. There is a feeling that there should be a central place which receives the purchases of all divisions and stores, and from which delivery is made to the users. This way missing and deteriorated items as well as theft can be reduced, the movement of items can be controlled, and the responsibility of every person can be delineated.

Existing theory of business procedures tells us that control system is necessary in order to get a good return on the job. But to be efficient, the stores should be well-established, and the storekeeping should be good with the storekeeper exposed to and applying new techniques. Outdated systems need to be replaced. Furthermore, sound management calls for the materials to be placed in the most efficient manner and the records to tell clearly and economically what is going on.

The case at hand thus focuses on the study of the elements of the existing store of the stationery and office supplies at B.U.C.. Where there are problems, new methods will be outlined in order to insure a good control system. The overall structure of this new system will also be shown.

Description of the Existing System

The purchasing department

The purchases

At B.U.C., purchases fall under one of the following categories:

- The division's specific items
- The division's common items

The first category is demanded by various divisions, directly delivered to them and charged to the expense account of the divisions; the second category is charged to the inventory account and is supplied to the post office. These are considered part of the college's current assets and as such are entered in the balance sheet statement.

The purchasing subsystem

The objective

The objective of the purchasing subsystem is to obtain the commodities needed in order that the college may carry out its planned activities.

The cycle of the subsystem

The subsystem cycle starts when the using department employee, in this case the post office clerk, determines the items needed, and issues a purchase requisition form in triplicate: two copies for the post office, and one for the purchasing department.

The supervisor of the purchasing department then conducts negotiations for purchases according to specified terms and conditions. Upon approval of the purchase, the supervisor of the purchasing department initiates and processes a purchase order in the name of the vendor.

When the supplier sends the items, the supervisor of purchasing compares the invoice with the green purchase order he has sorted in a box file. If the prices of the items of the invoice match those of the purchase order, the supervisor accepts receipt of the material and asks the supplier to distribute the items to the various divisions or to the post office.

In the division or the post office, the person in charge checks the quantities received with those of the white purchase requisition attached to the purchase order and the invoice to see whether they match.

If for some reason the quantities do not match, the items are immediately sent back to the supplier. On the other hand, if they do, the person in charge signs the white purchase order to approve the receipt of all items demanded; the three documents are then sent to the supervisor of the purchasing department.

The supervisor of the purchasing department then sends the invoice, the purchase requisition and the purchase order to the business office or to the accounting department in order to initiate a cheque in the amount of the invoice.

## The inventory system

### Description of the post office

At B.U.C. the post office is located in the business building, Nicol Hall. The room is used for two purposes: to mail letters and to store stationery.

As a matter of fact, the space of the room is not entirely provided for the stationeries; only U-shaped, it is not used in the most efficient way. The room is separated by a segmented iron gate which can be and has been many times in the past easily broken. Only recently, an iron net was installed around and above the mail boxes up to the ceiling to prevent theft from occurring. The humidity of the walls affects the paper items, and water drips from the ceiling. Fire protection is also not provided.

Cupboards and wooden shelves are the places for storing the stationeries. Small items such as pens, ribbons, staplers, etc. are placed in the cupboards; paper items are stocked on the shelves. Damaged papers are thrown at one end of the room on the shelves, and they are excluded from inventory. In two wooden cupboards ditto papers along with damaged and new telephones are placed in disorder. The post office clerk does not pay attention to the commodities in those cupboards due to the presence of mice. Other items such as covers of graduation for the registrar's office, envelopes for the dean's office and telephones which are not part of the inventory are placed on shelves.

### The personnel

The post office clerk who used to be a regular telephone operator is in charge of the mail. She was transferred to this post to fill the vacancy. In addition to this job, she runs the stationery. She is the one that does the order, receives it, signs the purchase order, places the items in the cupboards or on the shelves and finally records the order. It is also her job to do the physical count at the end of each month and at the end of the year. Hence, she is the one that makes the decisions.

About twelve student assistants help her. Sometimes, she is asked to replace the telephone operator during her duty and has to leave her place. One of her assistants then replaces her to answer the telephone calls or to provide help for students, staff, or faculty who want to send mail or who ask for stationery. To accomplish the latter objective, the post office clerk must return to her office to supply the department with the needed items since she locks the cupboards and the gate and takes the keys with her.

### The documents

Four specific forms are used by B.U.C. to move inventory items in and out of the post office and the various divisions and keep inventory information.

The purchase order: This document is divided into two parts:

The header containing all the general information concerning the order, including the name and address of the vendor, shipping information, sometimes price discount information, billing

information and other data relevant to all of the items to be purchased on this order such as suggested location, account number, requisition number and consignment date, the signature of the supervisor of department, the director of administration, the dean and the president.

The line items with each line containing specific information relevant to one item being purchased, the quantity of this item, the unit price and the total price.

The purchase order is prepared in five copies:

- The white copy for the supplier
- The green and blue copies for the purchasing department
- The yellow copy for the division
- The pink copy for the business office

The purchase requisition: This document provides information on the name of the department or division requesting the items, the date of the request, the account number of the item. It also provides information for a description of the item to be purchased, item number, the quantity, the unit price estimate and amount. It also states the estimated date of purchase, supplies a space for appropriate signatures of approval such as the signature of the supervisor of the department or the chairman, that of the supervisor of campus service or purchasing department and that of the director of administration. In addition, it has a space to write down all remarks pertaining to that purchase.

The purchase requisition is prepared in three copies:

The white and yellow copies for the purchasing  
department or campus service  
The orange copy for the division

The stationery-and-supply requisition form: This form indicates the date on which a given order is sent by the employees working at a given division or office to the post office and contains a list of the items available at B.U.C., the quantity ordered, the unit price, the total price and the grand total. The prices are filled in by the post office clerk, and the only required signature is that of the person requesting the order. This form is issued in one copy only.

The same form is used upon the receipt by the post office of any order purchased. On this form, the quantity received, the market price and the total price are recorded. This form is also used to indicate the remaining items in inventory at the end of each month and at the end of the year at their appropriate prices.

All the above-mentioned forms are used as source documents to update the inventory card used at the post office.

The inventory card: There is an inventory card for every item which contains information about the item, its number, its price, the date of removal of the item, the quantity delivered, the quantity received and the new balance on hand.

The system of the inventory

Usually the employees of the divisions or offices fill in the stationery and supply-requisition form with the quantity needed of the items and send it to the post office. The post office clerk

Date     /     /    

BUC BEIRUT UNIVERSITY COLLEGE  
 P.O. BOX 13-5053 BEIRUT-LEBANON  
 Tel: 811968 Cable Address : BECOGE  
 Telex: 23389 LE PURCHASE ORDER

No. 3518  
 This number must appear on all invoices and correspondence pertaining to this purchase order.

NAME: \_\_\_\_\_ Direct deliveries to: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ Division: \_\_\_\_\_  
 TEL: \_\_\_\_\_ Building: \_\_\_\_\_

Required On/or before	Suggested location	Requisition NO.	Account NO.	Terms
Item	Description	Quantity	Unit Price	Amount
Total				

RECEIVERS'S SIGNATURES:

Campus Services  
 Supervisor \_\_\_\_\_  
 Director of  
 Administration \_\_\_\_\_  
 Dean \_\_\_\_\_  
 President \_\_\_\_\_

Copies: 1st Suppliers White  
 2nd Campus Services Green  
 3rd Business Office Pink  
 4th Division Yellow  
 5th File Blue

BUSINESS OFFICE COPY

Figure 1



BUC

BEIRUT UNIVERSITY COLLEGE

كلية بيروت الجامعة

P.O.BOX 13-5053 BEIRUT-LEBANON

Tel: 811968 Cable Address: BECOGE

PURCHASE REQUISITION

No. 09724

Telex: 23389 LE

Memo To: Campus Services

Date \_\_\_\_\_

From: \_\_\_\_\_ /Div: \_\_\_\_\_

Subject: Purchase Requisition

Account No. \_\_\_\_\_

Item No.	Description	Quantity	Estimated	
			U/P	Amount

Approvals:

Signature \_\_\_\_\_ Div.Chairman / Supervisor \_\_\_\_\_

Suggested Vendor \_\_\_\_\_

\_\_\_\_\_ Campus Services \_\_\_\_\_

\_\_\_\_\_ Director of Administration \_\_\_\_\_

Estimated Date of Purchase.....

Remarks.....

.....

.....

Note: This Purchase Requisition form when approved by the Division Chairman/Supervisor is valid for purchases up to L.L. 200 For reimbursement it should be approved by the Director of Administration and presented to the Business Office with an invoice. For purchases above L.L. 200 this form should be sent to the Campus Services office for processing.

Figure 2

BEIRUT UNIVERSITY COLLEGE  
Beirut, Lebanon  
(Ref.6674)

STATIONARY & SUPPLIES-REQUISITION FORM

Memo to : The Post Office  
 From : \_\_\_\_\_ Div. \_\_\_\_\_ Date \_\_\_\_\_ Acct.# \_\_\_\_\_  
 Subject : Stationery & Supplies

Item	Price		Item	Price	
	Unit	Qty		Unit	Qty
Booklets:			Pads-Long		
Exams-(Arabic)			Pads-Memo		
Exams-(English)			Pads-Square		
Message			Pads-Yellow		
Calendar-Desk Stand			Paper-Canson		
Calendar-Refill			Paper-Letterheads		
Carbon Paper-Black			Paper-Typing(Thick)		
Carbon Paper-Blue			Paper-Typing(Thin)		
Cassettes			Paper-For Ditto		
Clips(Large)			Pencils		
Clips(Medium)			Pens-Ball Point(Black)		
Clips(Small)			Pens-Ball Point(Blue)		
Envelops-Airmail			Pens-Ball Point(Red)		
Envelops Manila(10*12)			Pens-Marker(Green)		
Envelops Manila(10*7)			Pens-Marker(Red)		
Envelops-White			Puncher-2-Hole		
Erasers-Pencil			Requests-Maintenance		
Tip-Ex(Bottle)			Requests-Purchase		
Tip-Ex(Paper)			Ribbons-Plastic		
File Fasteners			Ribbons-Silk(Arabic)		
Fluids-Cleaning			Ribbons-Silk(English)		
Fluids-Correcting			Ribbons-Wang		
Fluids-Duplicating			Rubber Bands		
Folders-Plain(Long)			Rulers		
Folders-Plain(Short)			Sellotape		
Glue-Plastic Bottle			Stamp Pad		
Glue-Rubber Cement			Staples(24/6)		
Grade Book			Staple-Remover		
Masters-Erasers			Staplers		
Masters-Offset			Stencils		
Masters-Spirit(Purple)			Thumb Tacks		

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Signature Approval \_\_\_\_\_  
 Grand Total \_\_\_\_\_

Figure 3

### The Stock Card

Article Name.....Manufacturer.....  
 Unit.....Size.....Colour.....Ref.No.....Price.....

Cost	Quantity Received	Date	Quantity Delivered	Balance in Stock	Inv. No.	Remarks
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....

Figure 4

checks whether the request is still within the required budget of the division or not. If it is not, the clerk of the post office will not deliver the items to the division. On the other hand, if the order of the division is still within its budget, the clerk will prepare the order, and a student assistant will deliver it to the division. The requisition form remains in the files of the post office and the other division or office does not keep any copy.

The clerk then records the quantity of each item withdrawn on its correspondent inventory card at that particular date. In case she notices that a shortage is going to arise, she will issue an order of the needed commodities on the purchase requisition form and send it to the purchasing department in order to do the buying. How much of a given item to order and at what minimum level to do the order are decisions made based on experience.

The moment the supplier delivers the required items, the post office clerk starts counting them and comparing the quantity received with the purchase requisition attached to the purchase order and the invoice. After checking the availability of each item, the clerk signs the purchase order and sends it to the purchasing department for processing.

Next the clerk places these items in the right empty places. But she does not use separate piles or colored labels for identification of items.

Finally she records the quantity of each item received on its related inventory card followed by the date of purchase. She also

determines the price at which the purchase was made. The new quantities and old ones are then calculated on the basis of the price of the last purchase. And the new balance on hand of each item is deduced.

#### The Problem of the System

Several factors contribute to the defects of the existing system:

1. Anyone can have access to the post office. The items are kept in the cupboards and on the shelves with no identification or labels on the materials. The damaged and missing items are not controlled. A newcomer cannot predict the order or the place of the materials, not even from the inventory card.
2. Only one person is in charge of the post office. This person receives, installs, records and delivers the items requested by the offices and the divisions. She also does the physical count of the inventory at the end of the month and even of the year without being controlled by another person. No one checks the inventory cards nor double counts the end of the year inventory.
3. The information of each item is written on the inventory card in pencil. Because of this, the information can be easily falsified. Moreover, the location of the items, the maximum quantity to order and the reorder point of a given item are not recorded on the inventory card.
4. There is no control on the quantity received by the departments or post office. The checking of the quantity is done only by the

receiving department. There is no receipt form to fill.

5. There is no control on the stationery and supply requisition form kept by the post office clerk. The other departments do not keep a copy of it. The accounting department receives only the one from the post office. There is no comparison between two copies. An item can be added at any time and charged to a given stationery and supply requisition form of a department without noticing it. Theft and fraud are thus easily accomplished.

#### The Need for the Study

As seen in Table 1, the growth of B.U.C. in terms of students and faculty has been accompanied by a great increase in the amount spent for the yearly purchases of stationery and supplies. In spite of this, Beirut University College was still managing the post office as a storeroom until October 1989 when the directors realized the necessity of implementing adequate places for storage, not only for the stationery and supplies but also for the detergents, tools and other equipment to organize the stores' operation and to exercise control over the items. Thus, the management decided to renovate three old places located in Nicol Hall Building for storage purpose. Carpentry, electrical and plumbing materials were to be stored in one of these facilities; detergents and sanitation supplies in the second; and the slow-moving items in the third. But these facilities were located apart from the office of the storekeeper. Moreover, they did not have good climate conditions or

TABLE I

GROWTH IN STUDENTS, FACULTY AND PURCHASES AT B.U.C.

YEAR	NO. OF STUDENTS	NO. OF FACULTY	PURCHASES(STATIONERY & SUPPLY)
86-87	6474	217	LL. 218,299.46
87-88	7100	245	LL. 1,103,573.13*

\* In year 1987-1988, the internal rate of US dollar used by the college fluctuated from 92.08 L.L. to 365.83 L.L..

Source: Records of the Business Office

ease of handling the materials. In trying to reorganize these stores, management will face other problems.

Today B.U.C.'s only record used to register the movement of items in and out of the post office is the inventory card. Management disregards the need for an inventory system since their yearly purchases are not comparable with the other expenditures, and since they do not need to reveal their books to the government as other organizations do. An inventory system is essential, however, in order to ease the reference of books to facilitate the internal work and help in the process of decision-making, i.e. for both efficiency and control. Such a system, to be successful, must be carefully studied and prepared to fit B.U.C.'s specific needs.

#### The Purpose of the Study

The purpose of this study, then, was to develop an effective inventory and control system that would be helpful for management in the process of decision making and planning.

In order to accomplish this objective, several factors were studied:

1. the physical layout of the storage facility,
2. the personnel needed to handle the inventory department, their number, position and qualification,
3. the location and identification of commodities,
4. the additional inventory records to be used,
5. management decisions on quantity of material to be purchased and timing of purchase,
6. a consistent pricing method to be adopted for inventory to show a true and fair view of the position and results.



## CHAPTER II

### STANDARDS OF PROCEDURES FOR INVENTORY CONTROL

Storage dates from earliest times when the Phoenicians found it necessary to build vaults to store their cargoes until the goods could be disposed of to the merchants. It was important in the Middle Ages in Venice and Genoa where ships were importing to their ports valuable cargoes from all over the world, and in the United States in early Colonial times when the cargoes used to reach the ports from Europe and were held in the buildings erected in the ports for safekeeping until it could be sold to their local merchants. Later on, storage buildings were built in inland cities and the seacoast upon the advent of railroading.<sup>2</sup> Today, storage is a vital factor in any business enterprise.

Regardless of their size, institutions, companies and universities which are involved in the preservation of commodities for future consumption or sale should own a place for holding their commodities and should protect them. The latter objective is maintained through control. Internal control as well as inventory control must be implemented by usage of techniques, methods and procedures to protect the system from numerous problems. Any good control system should

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<sup>2</sup>Frank Dorr, "Warehouse", Encyclopedia Americana, 1983, V28, p.352.

1. ensure that people are working effectively and efficiently,
2. ensure that the storage space is used to its utmost,
3. protect inventory from being lost or stolen,
4. ensure that the records are accurate and complete,
5. maintain the optimum level of inventory and the availability of inventory.

---

### Theoretical Procedures for Control

#### People

People are the major element in internal control. In order for the system to function properly and the control to be effective the people who work in it should be honest and competent. They should be qualified with good references and bond in position of trust, and they should have annual vacation. In addition, each employee should be assigned a job description and get to know both what to do and what others do.<sup>3</sup>

The purchasing function should be separated from the receiving function; the receiving from the storekeeping; and storekeeping from recordkeeping. This means that the employee who receives the inventory should be different from the one who does the purchase. Also, the employee who does the receiving should be different from the one who does the storekeeping. In this way, additional checks are provided.<sup>4</sup>

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<sup>3</sup>Paul Hooper, John Page, Financial Accounting, ( New York: West Publishing Company, 1982), p.235.

<sup>4</sup>Ibid.

Furthermore, the physical count of the inventory should be done periodically for control purposes, and it should be performed by employees who are not in charge of the inventory.<sup>5</sup>

The person in charge of inventory should not be in charge of the inventory records; theft can be easily covered in the accounting records.<sup>6</sup>

### Space

The location of the facility should satisfy the customer service requirements at the least total cost and should involve the study of transportation. The size of the location should be a function of anticipated volume plus an allowance for growth. Also storage methods should be considered because they influence the layout features such as aisle placement and width, storage racks, bins and work areas. The basic storage system involves stacking pallet loads one on top of another. But racks which permit placement or retrieval of a pallet load without disturbing other loads should be provided to overcome the difficulty of stock rotation and the crush of packages on the bottom, and to enable stocking to full height. Bins are typically used for small items and shelves for larger and odd-shaped items.<sup>7</sup>

The stockroom should be isolated as much as possible. Only the persons who are connected with the stockroom should enter the area.

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<sup>5</sup> Ibid., p.233.

<sup>6</sup> Ibid.

<sup>7</sup> Warren Blanding, " Storage and Warehousing ", Encyclopedia Britanica, 1975, V. 17, pp.709-711.

This way the movement of material without authority is reduced.<sup>8</sup> The place needs fences if it is in an open area. The gates should be locked. The place should not only be highly secured, it should also be climate-controlled: heating or cooling the store is likely to be inefficient and costly. Because labour productivity drops sharply in extremes of climate, stores in cold climate are often equipped with special door-area heaters while stores in warm climate are air-conditioned. Waterproof ceiling should be provided, and fireproof materials should be used to protect the contents.<sup>9</sup>

#### Items

It is necessary to keep the material in order and to keep track of it to maintain the records as accurately as possible since the inventory control depends on records which in turn depends on accuracy of reports of material flowing into and out of the stockroom. The materials are too many for a person to remember the place of each item, but it is necessary to know where the items are so they can be handed out effectively and efficiently. For this reason, the location records are very important. They will decrease the time lost for looking for such items, long learning times for new stockroom personnel, duplicate procurement for supposed lost items and waste space due to inefficient location of stock. In short, "every stock item should have an address."<sup>10</sup>

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<sup>8</sup> Hooper & Page, p.236.

<sup>9</sup> Warren Blanding, p.712.

<sup>10</sup> Robert VanDerMark, Inventory Control Techniques, (Dallas: VanDerMark Inc., 1965), p.125.

Identification of material is very important and useful, so material should have a label. It may be on the material itself, or be on a package to indicate its contents.<sup>11</sup>

### Records

Requisition forms should be filled out and approved by the supervisor of the department or storeroom to ensure that the purchases are authorized.<sup>12</sup> This is essential because the purchasing agent may collude with the supplier by

buying more goods than are actually needed, and/or  
paying a higher price than is actually required.<sup>13</sup>

When the items are moved from the storeroom to the sale department, a document should be prepared to approve this sale, and the sale clerk should sign it to indicate receipt of the items. All documents should be pre-numbered in order to ensure their physical control. Movement without paperwork should be forbidden and checked constantly.<sup>14</sup>

Purchase returns should be supervised to ensure that proper credit is obtained for returned inventory.<sup>15</sup>

It is possible to use the perpetual inventory system. The receipts and withdrawals of the items will be recorded as they occur. If the system is used properly, the accounting records should

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<sup>11</sup>Ibid., pp. 125-126.

<sup>12</sup>Hooper & Page, p. 236.

<sup>13</sup>Ibid., p. 233.

<sup>14</sup>Ibid., p. 234

<sup>15</sup>Ibid., p. 233.

be updated in conformation with the physical realities of inventory.<sup>16</sup>

Documents and records should be filled out with blocks for necessary approval signatures. They should be kept in fireproof safes for additional security as it is very difficult to reconstruct them.<sup>17</sup>

### Inventory

The goal of inventory control is to provide better service to the customer. It should provide the material at the right times in the right amounts by the use of specific techniques. With inventory control, we should know when to order and the order point. It establishes replenishment signals which insure material availability when customers request it. Inventory control buys or makes materials in the quantities most likely to be requested thereby matching the customer demand; each item in inventory must be kept at the right level to satisfy the customer demand. Inventory control seeks proper balance of total inventories. Stock control or physical control, however, is the most important phase of inventory control; without it, all other work in inventory control is meaningless.<sup>18</sup>

### Control Procedures Being Practiced at Various Other Institutions

Interviews with people concerned were conducted in West Beirut

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<sup>16</sup>Ibid., p.234.

<sup>17</sup>Ibid., p.236.

<sup>18</sup>VanDerMark, p. 126.

on the inventory systems of various educational and financial institutions such as the Near East School of Theology, the American University of Beirut, the Beirut Arab University and the Al-Madina Bank. Different opinions were presented. Some institutions were interested and following an inventory control system; others were not. Size of institution seemed to be the determining factor.

#### NEST

No inventory control system is being followed at NEST, a small institution of sixteen students. Its turnover is very low and its purchases occur in small quantities every three months.

#### The American University of Beirut

At A.U.B., the inventory system is centralized. All kinds of purchases for both the stores and the divisions must pass first by the central receiving area or the supply department, where a receiving clerk receives the quantity ordered. He then checks the quantity received with the purchase requisition and signs a receiving report. Next, he delivers or distributes the goods to the related stores or divisions.

In the division or in the store, the person requesting the material must sign the receiving report as well. Missing items and theft can be identified through control of this report. The storekeeper installs the materials in places and records each item on its inventory card along with a code assigned to the item and its location. This inventory card is a summary of all purchases and

consumptions of a given item during a year or years. However, similar inventory cards for a specific item for every department are attached to the general one. This cardex shows the in and out of all purchases and consumptions of a specific department and the quantity on hand. This is a means of control for on-the-spot questions which are asked by the accounting department to know the quantity consumed or purchased; it is also a means of reconciliation with the general inventory card. It even enables the storekeeper to predict the time other departments are going to order.

The information of every transaction is entered in the computer by a key puncher and a report is sent to the accounting department in terms of units and not in monetary terms. This report is used as a double check with the departments.

A physical count is done at the end of the year. The deteriorated item is thrown; the dormant item is requested by the department rather than by the stores. A given percentage of loss is allowed. If this percentage is exceeded, the storekeeper is charged against this loss. To avoid theft, some items requested by the departments, such as exam booklets, are headed with the name of the department concerned.

#### Beirut Arab University

At the Arab University, the system is a decentralized one. The purchases are divided into several kinds: the stationery and supplies; the carpentry, the electrical and plumbing materials; the



chemical products; the painting; the detergents; the fixed assets: every kind of purchase has a store. And every two or three stores have a storekeeper. This storekeeper receives, delivers, installs the items, and records on the inventory card and in a journal book these transactions. The storekeeper does not price the items; he shows only the quantities. He must, in addition, inform the purchasing department of every transaction with a document supporting it. Orders done on the telephone are not accepted. No one can replace the storekeeper; during his absence, the store is closed.

The purchasing manager keeps track of all transactions in and out of the stores in a purchasing journal. This journal is divided into columns for the various kinds of purchases; it shows the purchases and the price at which these purchases were made. The purchasing manager is the one that provides the management with the budget forecast for the next year based on this journal. He also has a journal that shows the quantity on hand of each item, the purchases performed, and the minimum and maximum point of each item during a given year. From this journal he can control the work of his storekeeper; on the other hand, the control is not only made on the quantity of the items, but also on the quality. In this way, he tries to prevent the storekeeper from bargaining and exchanging the existing items for ones of low quality.

The inventory count is done once a year in the summer. A committee consisting of a person from the purchasing department, one from the finance department, and one from the accounting department

meet to determine the ending inventory or to take decisions about the deteriorated and dormant items.

#### The Al-Madina Bank

The system in the bank of AL-Madina is centralized. That is, all the purchases for all branches and all departments are done through the administration department in the head office. The inventory is considered as a subsystem of this department. The inventories are divided into two groups: the fixed assets and the stationery or consumables. Each group is headed by a storekeeper.

This storekeeper is responsible for receiving and delivering the quantity of every item. He is also responsible for recording the transactions of the items in and out of the store on their related inventory cards. This inventory card includes the reference number of each item, its model, the date of the purchase, the unit price, and the quantity available in the store.

Every month, each department or branch prepares a requisition form showing the stationery needed and sends it to the administrative department which in turn sends the form to the storekeeper to prepare the order. Upon delivery, the using department signs this form. Orders can also be made and taken by telephone, in which case a copy book issued for every department is used. The storekeepers record the amount that is delivered and the amount requested. A signature for the person requesting the order follows implying the approval of the items received. In case the

items are erroneously charged to the non-using department or branch, control can be achieved through this copy book.

In case of a request for a fixed asset, a purchase requisition must be prepared and sent to the administrative department. This form could be rejected or accepted. If it is accepted, the order is delivered and signed by the using department. Calls are not, however, accepted for this category of purchases.

In the bank, it is the job of the internal auditors to check the physical count at the end of the year and in this way to control the movement in and out of the items.

A comparison of all the above organizations interviewed reveals that size is an important factor in determining the control function. The larger the organization, the greater the volume of its inventories, and the more it is concerned with control for both efficiency and economy.

The means of control for the large organizations differs. At A.U.B. and Al-Madina Bank a centralized system is preferred to a decentralized one. In this way, control is done on both the supplying department and the stores, enhancing double checks and reducing the element of theft and fraud. At Beirut Arab University the decentralized system would be a problem if the people working are not honest.

In particular, the use of the inventory card for every department as is done at A.U.B. seems a good idea because it is the easiest way of control for the accounting department to be informed of the available stock on hand, the amount consumed and ordered at a given time. It also helps in making budget decisions.

## CHAPTER III

### THE OPERATION IN THEORY:

#### FACILITY, PERSONNEL, RECORDS, PRICING AND BASIC

#### INVENTORY DECISIONS

To develop a good inventory system for B.U.C., all elements need to be defined and be possible. In this chapter, then, the major factors contributing to an organized inventory system will be analyzed. In addition, an introduction of all the pricing methods with their pros and cons will be presented along with the basic inventory decisions formulas adopted to determine the maximum quantity to order and when to order.

#### The Choice of the Facility

The decision on location for storage and inventory is very important for once it is made it is rarely changed. A stores design is based on forecasts of requirements and determination of the aisles and the shapes and volume of goods the store will be handling; storage racks, bins, pallets and work areas, fire protection and lighting is also taken into consideration.<sup>19</sup>

#### The Organization Chart of the Inventory Department

An inventory department should have a stock controller whose job is to control the stock control office and the storekeeping.<sup>20</sup>

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ع. غنایم، إدارة المشتريات والمخازن، (بيروت: دار النهضة العربية، ١٩٨٥)، ص. ١٩٤.

<sup>20</sup>T. Wolf, Better Management of Maintenance Stores and Inventories, (England: Industrial and Commercial Techniques LTD, 1968), pp.23-25.

The stock control office usually consists of three persons: the clerk of control records whose job is to record the transactions in and out of the store and to make sure that the items are reordered when they should be; the typist; and the filing clerk.<sup>21</sup>

The storekeeping personnel consists of the receiving clerk whose job is to receive the items delivered to the storeroom; the sale clerk whose job is to deliver the items requested by various departments; and finally the storekeeper who is responsible for "having the right items on hand when they are needed."<sup>22</sup> Of course, he cannot avoid all stockouts, but he should do his best in order to minimize the run-out. He should also tell the purchasing department what, when, and how much to order in coordination with the clerk of control records. Last, he should compare the stock with the records.<sup>23</sup>

#### The Design of Records

The stock records and transaction documents must be designed to

1. record existing inventory and indicate discrepancies in stock taking,
2. help determine the future demands,
3. obviate reference to buried records or reliance on memory,
4. reduce the need to rewrite information at different stages and each time it is processed,
5. reduce queries from other departments.<sup>24</sup>

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<sup>21</sup>Ibid.

<sup>22</sup>Ibid.

<sup>23</sup>Ibid.

<sup>24</sup>p.Baily & G. Tavernier, Stock Control Systems & Records, (Great Britain: Gower Publishing Company limited, 1984), 2nd

All records and documents must be used properly. They should always be updated in order to have value. The data should be presented in a form that is understandable to the people who have access to the information. Below is an analysis of these records.

The receiving report

This report should identify the items received, rejected and accepted after doing a thorough examination on the items. The form for this is shown in figure 5.<sup>25</sup>

The sale order

This order should certify the quantity of items requested by the various departments of the college from the inventory department. Each department should keep two copies: one to be sorted in a file, and one to be sent to the Business Office or the Accounting Department. The form for this is shown in figure 6.<sup>26</sup>

The sale permission form

The inventory department should fill in this form to approve the delivery of the items requested by various departments. Such a form is shown in figure 7.<sup>27</sup>

Any change in the quantity and price should be accompanied by the signature of the supervisor for approval; if not, the form will be rejected.

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<sup>25</sup> Ghanaem, p.103.

<sup>26</sup> Ibid., p. 107.

<sup>27</sup> Ibid.

### The sale journal

The sale journal is a convenient listing of all sale transactions for a period. This listing facilitates the recording and classifying of the repetitive event because the format of the journal is designed to record sales. Posting is also facilitated because all sale information appears in one place. An example of a typical sale journal is shown in figure 8.<sup>28</sup>

The sale journal is organized by date of transaction, and each sale event is recorded by the specific customer to whom the sale was made. A column is provided for the number of the source documents resulting from the sale and is the basis for the journal entry. This column is important for control purposes for the transactions can be traced back to the original documents which may be an invoice, sale slip or other documents. The check (✓) indicates that the individual amount was posted to subsidiary ledger account, i.e department and sales. This may be a double check of posting every transaction because it is marked when the amounts are posted to the ledgers.

### The purchase journal

This journal is designed to handle all purchases to facilitate the recording of these repetitive events; special debit columns have been provided which require writing only the amounts involved in each transaction.<sup>29</sup>

The purchase journal is organized by date of transaction. Each

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<sup>28</sup> Hooper & Page, p.221.

<sup>29</sup> Ibid., p. 222.



purchase is recorded by the specific supplier from whom the purchase was made. The check (✓) indicates that the amount is posted to a subsidiary ledger or to the stock card. An example of a typical purchase journal is given in figure 9.

#### The stock card

The stock card should provide additional information:

- a. The units of issue: spelled out or abbreviated. For example, PK will stand for package; BX for box; PR for pair.
- b. The location of the item
- c. The maximum or reorder quantity
- d. The minimum or reorder point
- e. The purchase order
- f. The issues<sup>30</sup>

#### Various Pricing Methods

Costing of inventory is a problem because it is difficult to determine which costs apply to items in inventory (i.e., determining the value of ending inventory and cost of goods sold). Costing of inventory is an important issue because it has direct effect on the income statement and the balance sheet; this study will focus, however, on the issue in terms of B.U.C.'s main objective which is not to make profit but to provide the management with the accounting data as a basis for decision making.

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<sup>30</sup>Wolf, p.33.

There are four methods of costing the inventory which produce different answers as to the cost of goods sold and the cost of the ending inventory depending on the cost of the units remaining in inventory at the end of the period. Once implemented, the method adopted by the college should be consistent from year to year. These methods are discussed in view of their practicality to B.U.C. under both systems: the periodic and the perpetual.

The periodic inventory system relies on a periodic physical count of the goods on hand as the basis for control, management decisions and financial accounting. Cost of sales is recorded as an adjusting entry at the end of the period. Cost of goods sold is determined from the basic inventory formula which brings together all inventory amounts from the general ledger and a physical count of inventory at the end of the period.<sup>31</sup>

The perpetual inventory system requires a continuous record of all receipts and withdrawals of each item of inventory. The perpetual record sometimes is kept in terms of quantities only. When a perpetual system is used, a physical count of the goods on hand is made periodically in order to verify the accuracy of the inventory reported in the accounting records. Any discrepancies discovered are to be corrected so that the perpetual inventory records are in agreement with the physical count. As a matter of fact, this procedure provides better control than can be obtained under the periodic system.<sup>32</sup>

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<sup>31</sup>Hooper & Page, p. 290.

<sup>32</sup>Ibid., p. 291.

### The first-in, first-out method

This method assumes that the oldest items on hand are sold first, and that those remaining in stock represent the latest purchases. In general, this conforms to reality; management usually finds it desirable to keep the oldest items moving out to customers and to keep fresh items on hand.<sup>33</sup> In B.U.C.'s terms, however, this reality does not hold since the items used at the university do not have an expiry date.

This method can be used if one is not interested in specifically identifying products or calculating averages.

### The advantages of the first-in, first-out method

1. This method is systematic and easy to apply. It is simple under the periodic and perpetual systems. Cost of goods sold and ending inventory figures are the same under both systems.
2. The cost assigned to inventory is close to the current prices paid for new inventories.
3. All purchase costs of inventory are passed in an orderly, predictable manner. As sales of inventory occur, the purchase costs of the oldest units still on hand become attachable to the units sold from the oldest to most recent.
4. Although it is a method for perishable products, still it can be applied to all types of products.
5. Cost of goods sold will be valued at the cost of goods on hand at the beginning of the period and the cost of earlier purchases of the period. This does not mean that the cost of goods sold is understated in the sense of an error, but it is simply stated at the lowest possible cost for any inventory situation.

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<sup>33</sup>Ibid., p. 298.

6. Net income in financial accounting is then stated as high as it can be. For some businesses, high net income is preferable. On the other hand, income subject to tax would be higher, and income tax would be higher. This advantage may be a disadvantage in some cases such as tax purposes.<sup>34</sup>

#### The weighted average method

This method is based on the assumption that all goods are commingled and that no particular batch of goods is retained in the inventory. Thus the inventory is taken on the basis of average prices paid for the goods, weighted according to the quantity purchased at each price.<sup>35</sup>

Under the weighted average two basic methods of computing average costs are used: the moving average method and the period average method.

#### The moving average method or perpetual system

Under this method, a new average cost will be computed upon each addition to the commodity pool. The cost will be the quotient of the sum of the cost of the units on hand before the receipt plus the cost of the units received divided by the total number of units after receipt.<sup>36</sup>

#### The period-average method

This method does not require the computation of a new average cost with each receipt but only once each period such as a month. Under this method, the new average cost is the quotient of the inventory on hand at the beginning of the period at the old average

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<sup>34</sup> Ibid., p. 299.

<sup>35</sup> A.N. Hosich & John E. Larren, Intermediate Accounting, ( New York: McGraw-Hill Book Company, 1963), pp.307-313.

<sup>36</sup> Ibid.

cost plus the total cost for the units purchased during the period divided by the sum of the quantity on hand at the beginning of the period plus the quantities purchased during the period. The cost of units consumed during a period is computed after the close of the period.<sup>37</sup>

#### Comparison of both methods

The period-average method is more practical than the moving-average method when there is a large volume of receipts and transfers out. Only one average calculation for each accounting period is required under periodic costing while a new average must be calculated each time products are sold under the moving method.

The cost of goods sold and ending inventory figures are different under both methods.<sup>38</sup>

#### Advantages of the weighted average method

1. The weighted average cost flow assumption is most appropriate where inventory units are physically mixed.
2. The average product sold matches the average cost implemented.
3. It is the most commonly used procedure for attributing costs to similar units.
4. It can be applied to inventory situations where goods are not physically mixed and be acceptable for income tax purposes and for financial accounting.
5. Under the periodic system, the calculations are simple and make this combination easy to implement.
6. It combines reasonable accuracy with practicality.

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<sup>37</sup> Ibid.

<sup>38</sup> Ibid.

7. This method produces a result for both inventory valuation and income determination, which lies between the results achieved under FIFO and LIFO.<sup>39</sup>

#### Disadvantages of the weighted average method

1. Under the perpetual system, it is difficult to implement because of the complexity of calculation. A new average must be calculated with frequent purchases and sales. The computer is essential to make this system practical.
2. It does not produce an inventory value consistent with the current costs of the items in inventory. It lags behind market prices.<sup>40</sup>

#### The last-in, first-out method

The last-in, first-out method is based on the assumption that the most recently acquired goods on hand are sold first because current costs are incurred to make current sales and to maintain adequate inventory on hand. The stocks to be carried forward as the inventory are also considered as if they were those earliest acquired.

LIFO is applied under the periodic system and the perpetual system. Cost of goods sold and ending inventory figures, however, will be different in both cases because last-in, first-out is applied only once at the end of the accounting period in the periodic approach, but it is applied each time a sale is made in perpetual systems.

Costs flow moves in an orderly systematic manner, but in the direction opposite from FIFO.<sup>41</sup>

#### Advantages of the last-in, first-out method

1. The most recent purchases are the most expensive purchase costs. Cost of goods sold is valued at the highest possible

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<sup>39</sup>Hooper & Page, p.297.

<sup>40</sup>Ibid.

<sup>41</sup>Ibid.

amount and net income will be as low as possible. This may be an advantage when income subject to tax will be low. It makes sense in a period of inflation because it minimizes income taxes.

2. LIFO permits management to influence immediate net income by the timing of purchases. If prices are rising and the institution wants to report low net income, it may buy a large amount of inventory near the end of the year. Management accelerates the replacement of inventory that would normally occur early in the next year.<sup>42</sup>

#### Disadvantages of the last-in, first-out method

1. The valuation of inventory will be lower than would be true with other costing methods as long as prices are rising because inventory are valued at the earliest costs in the balance sheet.
2. Reported net income will be low and the investors or owners will react negatively to this sign.
3. Under the perpetual system, LIFO procedure is overwhelming especially without the aid of a computer because LIFO works backwards from the date of each sale rather than from the end of the accounting period as in the periodic system.<sup>43</sup>

#### The specific identification method

This technique is used most often with respect to high value, low quantity items because each item of inventory should be physically differentiated and identified with its cost and the sum of these amounts should constitute the inventory value. That is, each unit in the ending inventory should be identified as coming from specific purchases and they are priced at the amounts listed on the purchase invoices.

The cost of goods sold and the ending inventory would have exactly the same numerical results if this technique is applied under the periodic system or the perpetual system.<sup>44</sup>

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<sup>42</sup>Ibid.

<sup>43</sup>Ibid.

Advantages of the specific identification method

1. The flow of inventory purchase costs reflects exactly the physical flow of products.
2. Each specific purchase cost of an individual item is matched against the item's revenue as sales take place.
3. It is practical and gives meaningful results where inventory is made up of high cost items, and small quantities selling at a low volume. It is even practical when one keeps track of the specific purchase costs of individual products.<sup>45</sup>

Disadvantages of the specific identification method

1. It is very expensive and impossible to implement this method where inventory consists of many identical items with low costs and selling at a high volume.
2. Specific identification of cost is not logical from the viewpoint of portraying periodic income. When there are large quantities of similar units having different costs, one cannot say whether one is better or worse off depending on which of the units were taken from the available supply.<sup>46</sup>

The Basic Inventory Decisions

Inventory decisions need to be made for every item in the inventory as one is interested in knowing how much to order at one time and when to order this quantity.

To answer the question of the maximum quantity required, one can refer to the four formulas: the optimum number of orders per year; the optimum number of units per order; the optimum number of day's supply per order; and the optimum number of dollars per order. It is better, however, if decisions are made in terms of number of units per order.

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<sup>45</sup>Hooper & Page, p. 293.

<sup>46</sup>Ibid.



Optimum number of units per order

In this case, the formula gives us the optimum number of units to order each time an order is placed.<sup>47</sup>

Let R = price of each unit

Nu = optimum number of units per order

A = total dollar value of the stockkeeping unit used per year

P = ordering cost per order placed

C = carrying cost expressed as a percentage of average inventory

Here, Nu is solved by letting

Total ordering cost/year = Carrying cost/year

$$A/Nu * p = AR/A/Nu * 1/2 * C$$

$$A/NU * P = ARC/2A/Nu$$

$$AP/Nu = RCNu/2$$

$$Nu^2 RC = 2AP$$

$$Nu^2 = 2AP/RC$$

$$Nu = \sqrt{2AP/RC}$$

Below is a summary of the kind of costs that are attributable to the order quantity.

The cost of ordering

Each time a purchase requisition is drawn up, both fixed and variable costs are incurred. The fixed costs of ordering are associated with the salaries of the permanent staff of the order department. The variable cost component consists of the purchase requisition form, the cost of sending this purchase requisition to

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<sup>47</sup>Levin & KirkPatrick, Quantitative Approaches to Management, (Tokyo: McGraw-Hill Kogakusha LTD, 1965), 3rd edition, p. 178.

the vendor, and any costs which increase as the number of purchase requisitions increases.<sup>48</sup>

#### The carrying costs

These costs are also referred to as holding costs and result from storing an item in inventory. Carrying costs are usually computed as a percentage of the cost of the annual average inventory. Some of the factors to be included in the carrying costs are as follows:

1. Cost of capital or interest on money invested in inventory
2. Obsolescence
3. Storage space rent including heat, lights or refrigeration
4. Stores operation including recordkeeping, the taking of physical inventory and protection
5. Taxes, insurance and depreciation
6. Deterioration<sup>49</sup>

#### The reorder point

It is the particular time when the purchasing agent knows to place a buying order to replenish the stock of some items. Reorder point reflects two variables: rate of use and lead time. Thus, reorder point is determined as follows:

$$\text{Reorder point} = \text{average daily use} * \text{lead time} + \text{safety stock}^{50}$$

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<sup>48</sup>Levin I. Richard, Charles A. Kirkpatrick, David S. Rubin, Quantitative Approaches to Management, (Duckland: McGraw-Hill International Book Company, 1982), 5th edition, p. 255.

<sup>49</sup>Ibid., p.256.

<sup>50</sup>Ibid., p. 297.

### Lead time

It is the period from the time one made the decision until the time the units are in their places ready to use. It may range from a day or two to several months. Lead time does not affect reorder quantity, but the longer the lead time the higher the reorder point should be to provide protection during the time when something has been ordered but has not yet been received. Variations in lead time or in demand cause stockouts.<sup>51</sup>

### Cost of out-of stock

Those costs are attributable to demand for an item during a period of out-of-stock conditions. Out-of-stock is an occasion when an item ordinarily carried in inventory is not currently on hand. That is new materials fail to arrive before the prior stock of an item runs out.<sup>52</sup>

### Safety stock

"The term safety stock refers to extra inventory held as a hedge, or protection against the possibility of a stockout." Safety stock will decrease the costs of stockouts and increase carrying costs.<sup>53</sup>

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<sup>51</sup>Ibid., p. 292.

<sup>52</sup>Ibid., pp. 292-293.

<sup>53</sup>Ibid., p. 293.

## CHAPTER IV

### DESIGNING AN OPTIMAL INVENTORY SYSTEM FOR B.U.C.: FACILITY, PERSONNEL, RECORDS, PRICING AND ORDERING

B.U.C. should be managed on the assumption of perpetual existence; there will be in this case continuous purchase of materials which may well be stocks on hand that could be consumed later on. It is these purchases that create what is called inventory.

At this time, not all B.U.C. purchases are inventoried and thus the institution does not meet the standard of other comparable institutions. An inventory system should be established. This system can provide the college with new stores, chart the personnel working in them, determine the records to be used, and effect control. Such an inventory system is here presented along with an application of the pricing methods. A summary and one of the basic decisions are provided and conclusions are drawn from both applications.

#### The Choice of the Facility

At this time, B.U.C. is not going to construct a new facility because of the lack of land. So it is going to work on an already existing facility the design of which is unalterable. Still minor changes can be made regarding the ventilation, the lighting, the security and the features of the items. The location of two B.U.C.

facilities were analyzed and determined: the first one in Shannon Hall, and the second one in the faculty building. In making the choice of both facilities, the following factors have been taken into consideration:

1. The area of the storeroom, the administration and service offices. Both places have ample space to store all materials of various purchases along with a space for the storekeeper and a space for receiving the items. Both locations were also suggested for there is no way to move into new quarters to accommodate the present stock. There would be empty places for the expected increase in items.
2. The exits. Shannon Hall has two exits so one can be used for the delivery of items and the other for the receipt of items. The faculty building has only one exit. In this case, a different time can be set for the delivery and receipt of items unless B.U.C. operates on a large scale. As a matter of fact, these two options maintain the control of items moving in and out of the store.
3. The existence vis a vis the modes of transportation to facilitate the moving of items from the supplier to the storeroom. The room in Shannon Hall is right inside the lower gates. The access to the room in the faculty building is from a door next to the road. Thus, in both cases, delivery of the materials can be easily effected.

4. The characteristics and the nature of the facility for stored items with special needs or arrangement. Both facilities have good climate for the stored items. But a fire extinguisher must be available to protect the materials from damage; the lighting must be adequate to save time if one is able to see what one is looking for and to verify it by reading the label on the bin, the shelves, the cupboards, etc.; a heavy door and windows need to be added to protect the elements or items from deterioration and to minimize the loss.

In making decisions on the location of stored items within the facility, the following features are desirable:

- a. The identification of the location will be for row, section and shelf.
- b. The bins will be the right size for the stock that is in them, and the shelves will be far apart for big pieces.
- c. Fast-moving items will be placed in front; slow-moving items in back.
- d. Take-home items will be kept under strict control so that employees are not unduly tempted.
- e. The like items will be kept together in order to facilitate the search of a given item. This will minimize the use of a catalogue in looking up locations.

#### The Organization Chart of the Proposed Inventory Department

For a graphic representation of the proposed system (see figure 10), the personnel are as follows:

THE PROPOSED ORGANIZATION CHART OF THE INVENTORY DEPARTMENT

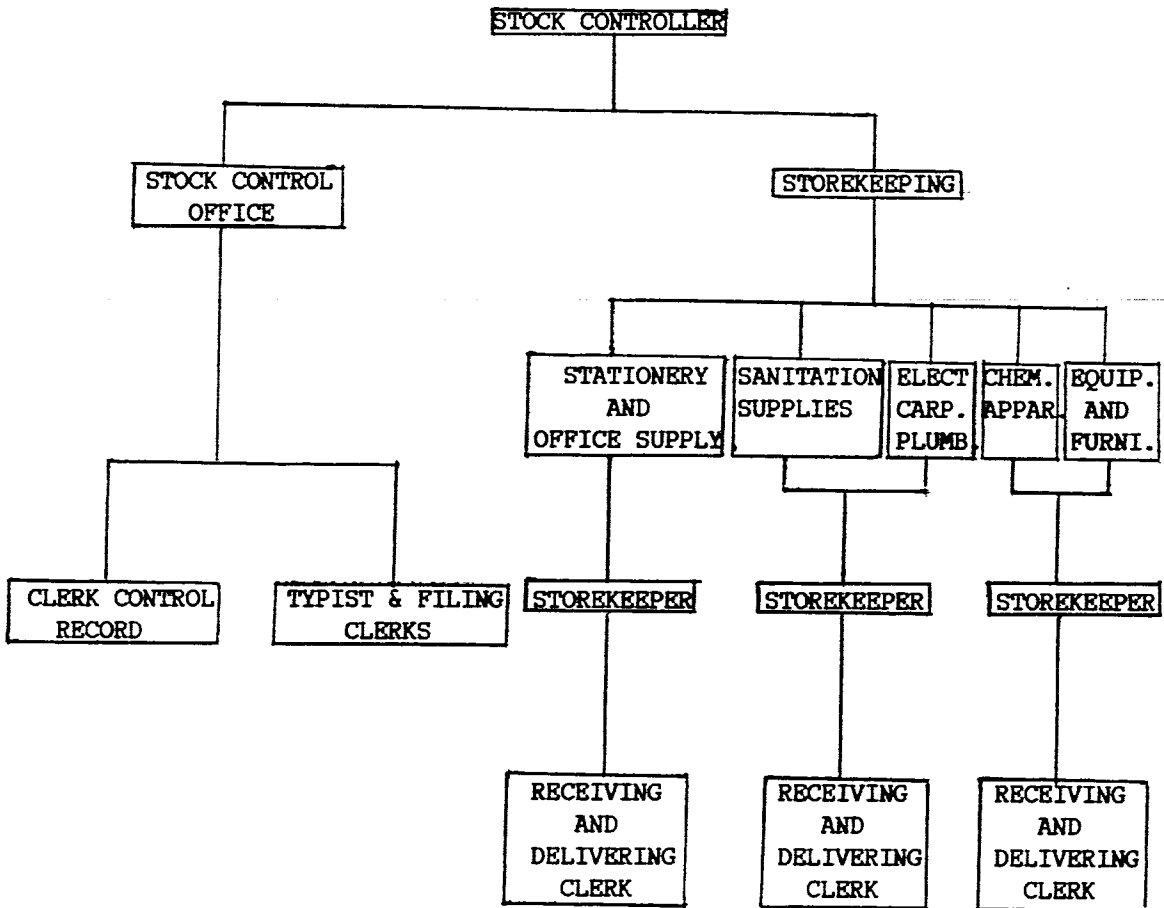


FIGURE 10

A stock controller to control the stock control office and the storekeeping. This may well be a person from the purchasing department if he has the training, the temperament and the time; or he may even be from the accounting department or business office, the logical choice since they keep track of all records.

One clerk control whose records should be available to maintain adequate control. He will record the transactions of all the stores.

A typist and a filing clerk who might well be a student assistant.

The receiving clerk and the sale clerk may be one person since every withdrawal and/or receipt is supported by a document and controlled by the storekeeper. Or the sale clerk may be a student from the using department for more control.

The storekeeper may be someone with experience in the storeroom and one who knows things about stock items. The storekeeper need not be an educated person. One storekeeper can run two stores since the daily transactions are not many.

On the whole, the increase in the number of employees will be determined by the workload.

#### The Additional Documents to be Used by the Various Departments

##### The central area

Once the items requested and ordered are supplied, they should pass to a central receiving area. A receiving clerk who receives the



commodities delivered by the supplier should count the items, record on a receiving report the quantity received, a description of the items received, a code number and then sign to indicate his approval (see figure 5).

#### Storekeeping

The sale clerk then distributes to the stores the items requested. Upon delivery, the storekeeper should count the commodities and sign the receiving report next to the signature of the receiving clerk of the supplying department. This signature is a means of control for theft or missing items.

A given department may ask the storekeeper to send some items. Once he prepares the order, he should initiate a consumption permission order to deliver the items. This permission order should be attached to the consumption order sent by the department for more control (see figure 7).

#### The using department

When a given department is in need of some items, it should issue a consumption order on which it shows the item number, the unit, the quantity needed, and the description of the items and sends it to the store. The department should keep a copy of this consumption order in its files. This way the business office because it is in charge of the accounting records of the purchases and inventories can control the work of the storekeeper and know whether he is stealing, charging the right quantity, or erroneously charging another department (see figure 6).

BEIRUT UNIVERSITY COLLEGE  
INVENTORY DEPARTMENT

RECEIVING REPORT NUMBER \_\_\_\_\_

DATE \_\_\_\_\_

MEMBER OF THE COMMITTEE:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_

Supervisor of the Committee  
 Purchasing Department  
 Stock Controller  
 Technician  
 Storekeeper of Central Area

SUPPLIER NAME \_\_\_\_\_

PURCHASE ORDER # \_\_\_\_\_

DATE \_\_\_\_\_

ITEM #	CATEGORY	UNIT	INVOICE #	QUANTITY			DECISION OF COMMITTEE
				RECEIVED	REJECTED	ACCEPTED	
COMMENTS				SIGNATURE			

RECEIVER NAME \_\_\_\_\_

STORE \_\_\_\_\_

FIGURE 5

BEIRUT UNIVERSITY COLLEGE  
INVENTORY DEPARTMENT  
STOREKEEPING

---

CONSUMPTION PERMISSION FORM

STORE \_\_\_\_\_ NUMBER \_\_\_\_\_

DATE \_\_\_\_\_  
REQUISITION NUMBER \_\_\_\_\_  
DIVISION \_\_\_\_\_

ITEM#	QUANTITY	UNIT	QUANTITY ON HAND	DESCRIPTION OF THE ITEM	UNIT PRICE	TOTAL PRICE

STOREKEEPER SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ RECEIVER SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

FIGURE 7

BEIRUT UNIVERSITY COLLEGE  
 INVENTORY DEPARTMENT  
STOREKEEPING

CONSUMPTION ORDER OF ITEMS FROM STORES  
 FROM STORE \_\_\_\_\_

NUMBER \_\_\_\_\_  
 NUMBER \_\_\_\_\_

DATE \_\_\_\_\_  
 DIVISION \_\_\_\_\_  
 REASON \_\_\_\_\_

ITEM#	QUANTITY	UNIT ISSUE	DESCRIPTION OF THE ITEM	QUANTITY REQUESTED

ONLY

NAME OF RECEIVER \_\_\_\_\_ SIGNATURE OF THE SUPERVISOR \_\_\_\_\_

CONSUMPTION PERMISSION NUMBER \_\_\_\_\_ DATE \_\_\_\_\_  
 STOREKEEPER SIGNATURE \_\_\_\_\_

FIGURE 6

### Subsidiary inventory card

The storekeeper keeps a detailed inventory card of each item for every department along with the general inventory card of the items for all departments. In doing so, the storekeeper can determine the position of every department in respect of their ordering; it is also a means of control for the business office for they can see if the figures match their records at any time.

### Stock control office

Another method is to use the consumption journal on which the consumption of all departments are recorded by providing a column for every department. From this journal, the clerk control record can determine the quantity. Or he can use the purchase journal as a mean to compare that all the purchase of the stores match those of the accounting records (see figures 8 & 9 ).

### Application of the Pricing Methods and Comparison

In applying the theory to practice for B.U.C. the cost of goods sold and the cost of ending inventory for the period is determined for the different pricing methods under both perpetual and periodic approaches. The results presented are compared to reach a conclusion.

The sample of the study is the English exam booklets. The figures of the beginning inventory, the quantity sold and purchased are those of the month of November of the year 1987. The unit of the beginning inventory is 17 packs at 1,852 L.L. each; 100 packs were purchased at 2,600 L.L. each.

BEIRUT UNIVERSITY COLLEGE  
INVENTORY DEPARTMENT  
STOCK CONTROL OFFICE

THE CONSUMPTION JOURNAL

PAGE # \_\_\_\_\_

DATE			SOURCE DOCUMENT NO.	CUSTOMER A/C NO.	DESCRIPTION OF ITEM	PR	AMOUNT
YY	MM	DD					
						✓	

FIGURE 8

BEIRUT UNIVERSITY COLLEGE  
INVENTORY DEPARTMENT  
STOCK CONTROL OFFICE

THE PURCHASE JOURNAL

PAGE # \_\_\_\_\_

DATE			DOCUMENT NO.	SUPPLIER	PURCHASES	PR	AMOUNT
YY	MM	DD					

FIGURE 9

Illustration of the first-in, first-out method-Periodic

Beginning inventory	17 * 1,852.50 =	31,492.50.L.L.
Purchase	100 * 2,600.00 =	<u>260,000.00</u>
Cost of good available for consumption		291,492.50.L.L.
Ending inventory	96 * 2,600.00 =	<u>249,600.00</u>
Cost of good consumed		41,892.50 L.L.

The L.L. 41,892.50 figure for cost of goods consumed could also have been computed directly as follows by adding the purchase costs of the first 21th inventory acquisitions of the period.

2 packs at 1,852.50 from beg.inventory	3,705.00 L.L.
5 packs at 1,852.50 from beg.inventory	9,262.50
2 packs at 1,852.50 from beg.inventory	3,705.00
5 packs at 1,852.50 from beg.inventory	9,262.50
2 packs at 1,852.50 from beg.inventory	3,705.00
1 pack at 1,852.50 from beg.inventory	1,852.50
1 pack at 2,600.00 from Nov.1 purchase	2,600.00
3 packs at 2,600.00 from Nov.1 purchase	<u>7,800.00</u>
	41,892.50 L.L.

=====

The adjusting entry at November 30 should be

Ending inventory	249,600.00 L.L.
Cost of goods consumed	41,892.50 L.L.
Purchase	260,000.00 L.L.
Beg.inventory	31,492.50 L.L.



Illustration of the first-in, first-out method-Perpetual

	<u>Units</u>		<u>Unit cost</u>	<u>Total cost</u>
Beg.inventory	17	*	1,852.50	31,492.50 L.L.
Consumption	- <u>2</u>	*	1,852.50	- <u>3,705.00</u>
	15			27,787.50 L.L.
Purchase Nov.1	+ <u>100</u>	*	2,600.00	+ <u>260,000.00</u>
	115			287,787.50 L.L.
Cons.Nov.1	- <u>5</u>	*	1,852.50	- <u>9,262.50</u>
	110			278,525.00 L.L.
Cons.Nov.10	- <u>2</u>	*	1,852.50	- <u>3,705.00</u>
	108			274,820.00 L.L.
Cons.Nov.16	- <u>5</u>	*	1,852.50	- <u>9,262.50</u>
	103			265,557.50 L.L.
Cons.Nov.23	- <u>2</u>	*	1,852.50	- <u>3,705.00</u>
	101			261,852.50 L.L.
Cons.Nov.26	- <u>1</u>	*	1,852.50	- <u>1,852.50</u>
	100			260,000.00 L.L.
Cons.Nov.27	- <u>1</u>	*	2,600.00	- <u>2,600.00</u>
	99			257,400.00 L.L.
Cons.Nov.30	- <u>3</u>	*	2,600.00	- <u>7,800.00</u>
	96			249,600.00 L.L.
				=====

Illustration of the weighted average-Periodic

Cost of goods available for consumption:

$$(17 \times 1,852.50) + (100 \times 2,600) = 291,492.5 \text{ L.L.}$$

Units available for consumption:

$$(17 + 100) = 117 \text{U}$$

Average cost of units available :

$$291,492.5 / 117 = 2,491.38 \text{ L.L.}$$

Cost of goods consumed :

$$21 * 2,491.38 = 52,318.98 \text{ L.L.}$$

Ending inventory as of Nov.87 :

$$96 * 2,491.38 = 239,172.48 \text{ L.L.}$$

Notice that in weighted average costing under the periodic approach, each unit of inventory and each unit consumed carry the same average cost for the period. One weighted average cost is computed each accounting period.

An adjusting entry would be made at the end of the period.

Inventory (ending)	239,172.48 L.L.
Cost of goods consumed	52,318.98 L.L.
Purchases	260,000.00 L.L.
Inventory (beginning)	31,492.50 L.L.

Illustration of weighted average-Perpetual

	<u>Units</u>	<u>Unit cost</u>	<u>Amount</u>	<u>Average</u>
Beg. inventory	17		31,492.50/17	1,852.50 L.L.
Consumption	- <u>2</u>	* 1,852.50	- <u>3,705.00</u>	
	15		27,787.50/15	1,852.50 L.L.
Receipt	+ <u>100</u>	* 2,600.00	+ <u>260,000.00</u>	
	115		287,787.50/115	2,502.50 L.L.
Consumption	- <u>5</u>		- <u>12,512.50</u>	
	110		275,275.00/110	2,502.50 L.L.
Consumption	- <u>2</u>		- <u>5,005.00</u>	
	108		270,270.00/108	2,502.50 L.L.
Consumption	- <u>5</u>		- <u>12,512.50</u>	
	103		257,757.50/103	2,502.50 L.L.
Consumption	- <u>2</u>		- <u>5,005.00</u>	
	101		252,752.50/101	2,502.50 L.L.
Consumption	- <u>2</u>		- <u>5,005.00</u>	
	99		247,747.50/99	2,502.50 L.L.
Consumption	- <u>3</u>		- <u>7,507.50</u>	
Ending inventory	96		240,240.00/96	2,502.50 L.L.

After each average, the units consumed as well as those remaining are assigned the average cost. Goods on hand always enter the next average calculation at the amount of the previous weighted average cost.

Illustration of the last-in, first-out method-Periodic

Beginning inventory	17 * 1,852.50 =	31,492.50 L.L.
Purchases	100 * 2,600.00 =	<u>+260,000.00</u>
Cost of goods available for consumption		291,492.50 L.L.
Ending inventory		<u>-236,892.50</u>
Cost of goods consumed		54,600.00 L.L.

=====

Ending inventory is valued as follows:

79 packs at 2,600.00 from Nov.87 purchases	205,400.00 L.L.
17 packs at 1,852.50 from beginning inventory	<u>+ 31,492.50 L.L.</u>
	236,892.50 L.L.

=====

The L.L. 54,600.00 figure for cost of goods consumed could also be calculated directly by summing the purchase costs of the last 21 inventory acquisitions of the period.

3 packs at 2,600.00 form purchase	7,800.00 L.L.
2 packs at 2,600.00 from purchase	5,200.00
2 packs at 2,600.00 from purchase	5,200.00
5 packs at 2,600.00 from purchase	13,000.00
2 packs at 2,600.00 from purchase	5,200.00
5 packs at 2,600.00 from purchase	13,000.00
2 packs at 2,600.00 from purchase	<u>5,200.00</u>
	54,600.00 L.L.

=====

The adjusting entry at Nov.30 would be

Ending inventory	236,892.50 L.L.
Cost of goods consumed	54,600.00 L.L.
Purchases	260,000.00 L.L.
Beginning inventory	31,492.50 L.L.

Illustration of the last-in, first-out method-Perpetual

	<u>Units</u>		<u>Unit cost</u>	<u>Total cost</u>
Beg.inventory	17		1,852.50	31,492.50 L.L.
Consumption	- <u>2</u>	*	1,852.50	- <u>3,705.00</u>
	15			27,787.50 L.L.
Purchase	+ <u>100</u>	*	2,600.00	+ <u>260,000.00</u>
	115			287,787.50 L.L.
Cons.Nov.1	- <u>5</u>	*	2,600.00	- <u>13,000.00</u>
	110			274,787.50 L.L.
Cons.Nov.10	- <u>2</u>	*	2,600.00	- <u>5,200.00</u>
	108			269,587.50 L.L.
Cons.Nov.16	- <u>5</u>	*	2,600.00	- <u>13,000.00</u>
	103			256,587.50 L.L.
Cons.Nov.23	- <u>2</u>	*	2,600.00	- <u>5,200.00</u>
	101			251,387.50 L.L.
Cons.Nov.26	- <u>2</u>	*	2,600.00	- <u>5,200.00</u>
	99			246,187.50 L.L.
Cons.Nov.30	- <u>3</u>	*	2,600.00	- <u>7,800.00</u>
Ending inventory	96			238,387.50 L.L.
				=====

Illustration of the specific identification method-Periodic

Suppose that the 96 packs in ending inventory come from the beginning inventory (8 packs) and the November 87 purchase (88 packs). Ending inventory would be valued as follows if the periodic inventory system and the specific identification costing are used.

Ending inventory

8 packs at 1,852.50 from beginning inventory	14,820.00 L.L.
88 packs at 2,600.00 from Nov..purchase	+ <u>228,800.00</u> L.L.
	243,620.00 L.L.

=====

Beginning inventory	17 * 1,852.50 = 31,492.50 L.L.
Purchase	+ 100 * 2,600.00 = <u>260,000.00</u>
Cost of goods available for consumption	291,492.50 L.L.
Ending inventory	- <u>243,620.00</u>
Cost of goods consumed	47,872.50 L.L.

=====

Cost of goods consumed is calculated as follows:

2 packs at 1,852.50 from beginning inventory	3,705.00 L.L.
5 packs at 2,600.00 from purchase	13,000.00
2 packs at 1,852.50 from beginning inventory	3,705.00
5 packs at 1,852.50 from beginning inventory	9,262.50
2 packs at 2,600.00 from purchase	5,200.00
2 packs at 2,600.00 from purchase	5,200.00
3 packs at 2,600.00 from purchase	<u>7,800.00</u>
	47,872.50 L.L.

=====



Nov. 23	Purchase 1	2	Beg.inv.	8 1,852.50	14,820.00
					+
			Purch.1	93 2,600.00	<u>241,800.00</u>
					256,620.00
					=====
Nov. 26	Purchase 1	2	Beg.inv.	8 1,852.50	14,820.00
					+
			Purch.1	91 2,600.00	<u>236,600.00</u>
					251,420.00
					=====
Nov. 30	Purchase 1	3	Beg.inv.	8 1,852.50	14,820.00
					+
			Purch.1	88 2,600.00	<u>228,800.00</u>
					243,620.00
					=====

#### Inventory costing methods compared

Table 2 brings together all of the various valuations of ending inventory and cost of goods consumed which could result from the transactions of the above samples.

The new system proposed for B.U.C. implements the first-in, first-out method for two major reasons:

1. B.U.C. is a non-profit organization. Reported high income won't affect it since it is not subject to income tax.
2. The ending inventory figures will approximate that of the market price because the most recent and most expensive costs remain in inventory at the end of the period.
3. B.U.C. should use the periodic approach because it is much easier. The perpetual approach is complex if used manually. If, however, B.U.C. introduces the computer to facilitate the calculations it could opt for the perpetual approach. This could be looked at especially for the future when the purchases will be subject to expansion. Both the amount assigned to ending inventory and the cost of goods consumed under FIFO are not affected by the basic inventory system chosen.



The application of the weighted average under the periodic approach is easy for B.U.C. to implement since only one average calculation is necessary for each accounting period. The simple calculations make this combination easy to implement. On the other hand, it is difficult to apply the perpetual approach unless there is a computer assistance because one should calculate a new average each time the items are consumed or purchased. Furthermore, the ending inventory value and cost of goods consumed lie between the extremes of FIFO and LIFO. Though the ending inventory figure lags behind the market prices, it is still sounder when compared to LIFO.

LIFO method of costing should not be used by B.U.C. because it reflects the lowest value of ending inventory since the oldest and least expensive costs remain in inventory at the end of the period. Moreover, it produces the lowest net income since the cost of goods consumed will be high because most recent and most expensive costs are charged to expense first. Showing the extreme of possible ending inventory and cost of good consumed is not an essential issue for B.U.C..

The costing method of specific identification should not be implemented since B.U.C. purchases in large quantities, consumes at high volume, and maintains an inventory consisting of identical items with low costs. It is, moreover, very difficult to implement under the perpetual approach.

TABLE II

COMPARISON OF THE PRICING METHODS

	FINANCIAL STAT. ITEMS	SPECIFIC IDENTIFICATION	WEIGHTED AVERAGE	FIFO	LIFO
PERIODIC	BEG. INV.	31,492.50	31,492.50	31,492.50	31,492.50
	PURCHASES	260,000.00	260,000.00	260,000.00	260,000.00
	COST OF GOOD CONSUMED	47,872.50	52,318.98	41,892.50	54,600.00
	END. INV.	243,620.00	239,172.48	249,600.00	236,892.50
PERPETUAL	BEG. INV.	31,492.50	31,492.50	31,492.50	31,492.50
	PURCHASES	260,000.00	260,000.00	260,000.00	260,000.00
	COST OF GOOD CONSUMED	47,872.50	51,252.50	41,892.50	53,105.00
	END. INV.	243,620.00	240,240.00	249,600.00	238,387.50

### Application of the Basic Inventory Decisions

#### The economic order quantity

The English exam booklets are the basis of this study and form an example for the other purchases made. The quantity purchased during the year was 20000 units for 19600.00 L.L.. It was consumed. The order cost 7,500 L.L. represented the cost per order placed for the purchase requisition. The carrying cost 5.92 was that of insurance.

Table III shows that as cost to carry declines, ordering costs increase. It also shows that total costs, the figure to minimize, are lowest when carrying costs are equal to ordering costs. This is the point needed to be determined because it is always the point of lowest total inventory costs for the year. In addition, it shows that the storekeeper should order this particular stockkeeping unit three times during the year. Moreover, the total costs for ordering two or four times a year is nearly the same. The practical significance of this fact and of the fact that the total cost curve is "dish-shaped" is that approximate answers in this situation are very good ones varying only slightly from ones to refer as optimum answers. As long as the storekeeper orders two, three or four times a year, the total inventory cost stays near the minimum.

Substituting the values given into the formula of the optimum number of units per order gives us the optimum number of units to order each time an order is placed. That is 7190 units per order.

The reorder point

Again, using the English exam booklets as an example, in making decision about the reorder point, the average daily consumption and the lead time were the only factors taken into consideration. The safety stock was not because the number of students was known at the beginning of the accademic year and order should be made depending on this factor. There is no unexpected event which may lead to a stockout. The demand is constant. So, the reorder point of the English exam booklets is determined as follows:

$$\text{Reorder point} = \text{average daily use} * \text{lead time}$$

The average daily consumption used to be 5 packs per day and the lead time fourteen days.

In this case, the reorder point is 70 packs (5 packs/day \* 14 days). At 70 packs, the storekeeper should place a buying order to replenish the stock of English exam booklets.

TABLE III

IDENTIFYING THE ECONOMIC ORDER QUANTITY

(1)		No. Orders per Year	1	2	3	4	5	10	12
(2)	$19600/(1)$	LL.per order	19600	9800	6533	4900	3920	1960	1633
(3)	$(2)/2$	Average inventory	9800	4900	3266	2450	1960	980	816
(4)	$(3)*5.92$	Carrying charges	58016	29008	19335	14504	11603	5801	4831
(5)	$(1)*7500$	Ordering cost	7500	15000	22500	30000	37500	75000	90000
(6)	$(4)+(5)$	Total cost per year	65516	44008	41835	44504	49103	80801	94831

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

With B.U.C.'s growth and the change in its structure expected in the future, the implementation of an effective inventory system seems essential. The following system as developed in chapter 4 is thus recommended.

#### Facilities

Two facilities will be used for storage: one in Shannon Hall and the other in the faculty building. Both have room to accommodate items of the same category; they also ensure safety and protect the items from being lost and deteriorated.

#### Personnel

These stores will be provided with the following personnel:

1. One storekeeper for both facilities
2. One receiving clerk and sale clerk for each
3. One typist and filing clerk who will be a student assistant.
4. One clerk control whose job is to record in the books or files all the daily transactions moving in and out of the stores.

The stock controller will be from the accounting department which keeps track of all the records. He will control the jobs of all the staff working in the inventory department; he will audit the physical count at the end of the year; he will also check the quality of the items.

### Records

The records suggested for usage to ensure control are those drawn up in chapter 4; sample forms are shown in figures 5-9.

1. The receiving report to control the stores, the purchasing department and the supplying department (Figure 5)
2. The consumption permission form to allow the movement of items in and out of the stores (Figure 7)
3. The inventory card will have additional information regarding the location of the items to facilitate the search for a given item, the maximum and minimum
4. The consumption journal and the purchase journal of every store which can be matched with the purchases and consumption entered by the accounting department in the inventory account of each store.(Figure 8 & 9)

### Costing

The FIFO method of costing should be implemented; it reveals the value of ending inventory that reflects the market prices, which is applicable to the balance sheet. On the other hand, reported low cost of goods consumed which enhances high income does not affect the financial position.

The periodic approach is the easiest one to follow. But if computer assistance is made available to facilitate the complexity of calculations, the perpetual approach can be chosen.

### Inventory Decisions

The mathematical equations of the optimum number of units per order can be applied in deciding how much to order of a given item

since the storekeeper deals in terms of quantity and not in terms of money.

In making decisions as to when to place an order to replenish the stock of the items, the formula applied should be the following:

Reorder point = average daily use \* lead time

B.U.C., like all institutions, profit-seeking or not, should achieve a proper balance of inventories for imbalance can be a financial drain. An inventory control system as here presented can be effective in managing and maintaining the proper levels of all types of inventories used in this institution.



## BIBLIOGRAPHY

Baily, Peter, Gerard Taverier, and Richard Storey. Stock Control Systems and Records. 2nd edition. London: Gower Publishing Company LTD, 1984.

Beirut University College. Academic Catalogue. 1980-1982.

Beirut University College. Accounting Record. Business Office. 1986-1988.

Blanding, Warren. " Storage and Warehousing ". Encyclopedia Britanica. 1975.

غنايم، عماد. إدارة المشتريات والمخازن. بيروت: دار النهضة العربية، ١٩٨٢.

Dorr, Frank. " Warehouse ". Encyclopedia Americana. 1983.

Hoffman, Raymond. Inventories. New York: The Ronald Press Company, 1962.

Hooper P., and J. Page. Financial Accounting. New York: West Publishing Company, 1982.

Horngren, Charles T. Introduction to Management Accounting. Sixth edition. New Jersey: Prentice Hall Inc., 1984.

Institution of Internal Auditors. Internal Audit of Inventory Control and Management. New York: The Institute of Internal Auditors Inc., 1970.

Levin, Richard, and Charles Kirkpatrick. Quantitative Approaches to Management. Third edition. Tokyo: McGraw-Hill Kogakusha LTD, 1965.

Levin, Richard I., Charles A. Kirkpatrick, and David S. Rubin. Quantitative Approaches to Management. Fifth edition. Duckland: McGraw-Hill International Book Company, 1982.

Mosich A.N., and E. John Larsen. Intermediate Accounting. Fifth edition. New York: McGraw-Hill Book Company, 1963.

Wolf, Theodore R. Better Management of Maintenance Stores and Inventories. England: Industrial and Commercial Techniques LTD, 1968.

VanderMark, Robert. Inventory Control Techniques. Dallas: VanDerMark Inc., 1965.

Interviews: Mrs. Violette Adel at NEST  
Mr. Samer Halabi at American University of Beirut  
Mr. Jamal Madhoune at Beirut Arab University  
Mr. Marwan Daoud at Al-Madina Bank