John Warman

warehouse management

JOHN WARMAN Warehouse Management



William Heinemann Ltd 10 Upper Grosvenor Street, London W1X 9PA LONDON MELBOURNE TORONTO JOHANNESBURG AUCKLAND

© John Warman 1971 First published 1971 Reprinted 1979, 1980

434 92224 2

Printed and bound in Great Britain by Fakenham Press Limited, Fakenham, Norfolk

Preface

It was while preparing a course of instruction for a number of aspirant managers that I scoured the library for a good book on the practical aspects of running a warehouse. I was looking for a book which tied together modern management theory with its practical application in the day-to-day running of the storehouse. There were many good books on theory, but there were none where the problems of applying theory to the everyday tasks were seriously tackled.

In an endeavour to remedy this situation, this book has been written to pull together in one work thoughts on as many of the facets of warehousing and storekeeping as possible. Managers and aspiring managers of this function in almost any enterprise will thereby have a foundation on which to build their further studies of this expensive business activity.

Within the book I have covered those aspects of warehousing and storekeeping management which need to be studied to satisfy the syllabuses of the Royal Society of Arts, as well as the Certificate in Storekeeping and the Final Diploma examination of the Institute of Purchasing and Supply. At the same time I have endeavoured to anticipate the increasing importance of the role of distribution and to suggest many other paths of enquiry which should be pursued by the manager who seeks to keep up to date with such a rapidly changing function.

The book is intended to indicate the cardinal points of each subject. It gives the general direction and, it is hoped, shows the way that the warehouse department connects with the others. I have tried to answer the question, 'What is involved in the management of a warehouse?' by connecting general management theory with practical experience. Because this is intended to be an essentially practical work, theory has been kept to a minimum, but where necessary I have gone into detail in an attempt to cover a wide part of what is largely unexplored country.

It is impossible to express thanks to every one of my friends who have, both wittingly and unwittingly, made their contribution to this

Contents

		Page
	Preface	vii
1	WAREHOUSING AND THE MANAGEMENT	
	FUNCTION	1
2	WAREHOUSING AND WAREHOUSES	5
	Storage buildings – Limitations of financial records	
3	SCARCE RESOURCES	10
	Measurement the basis of control - Analysis of	
	resources	
4	LOOKING BACKWARDS AND FORWARDS	13
	Inadequate stores services - The buyer - The	
	industrial engineering approach - Present-day trends	
5	SITING AND CONSTRUCTION OF STORES AND	
	WAREHOUSES	18
	Siting - Buildings and their construction - New	
_	buildings for old	
6	THE CARE OF THE PREMISES	32
	Inspection procedures - Lighting, heating, and	
	maintenance	_
7	PLANNING	37
	Constructing a plan - Organizing the plan -	
	Flexibility - Steps in planning - Control	
8	PRACTICAL SUPERVISION OF THE WAREHOUSE	45
	The manager's responsibilities - Checking and	
_	control – Conclusion	
9	THE WAREHOUSE AND GOODS MOVEMENT THEORY	53
	Is there a need for storage? - Movement of goods -	
	The bulk-storage area - The picking area - Aisles -	
10	The need for measurement – Seasonal demands	
10	THE RECEIPT OF GOODS	73
	Suppliers and hauliers – Goods-received department	
	- Off-loading	

x Warehouse Management

		Page
11	PLATFORMS, PALLETS, AND OTHER STILLAGES Platforms and pallets	79
12	MATERIALS HANDLING AND MOVEMENT Movement in a continuous stream – Trolleys – Machinery – Granular materials	86
13	MACHINERY AND MECHANIZATION Mechanization and automation — Mechanizing a pickline — Mechanization in general	94
14	THE FORK-LIFT TRUCK Buying a fork-lift truck – Manual fork-lift trucks – Rider-controlled trucks and reach trucks – Attachments to the fork-lift truck	
15	RACKS AND RACKING Live-storage racking – Automatic and self-moving racking	108
16	WORK MEASUREMENT AND TIME STUDY Method study – Work measurement – Charts	112
17	ADMINISTRATION Conditions of work – Records – Information flow – Statistics	118
18	STOCK CONTROL AND STOCK-TAKING Stock control – Stock-keeping records – Stock-taking – More sophisticated control – Stock valuation and stock-taking	124
19	COMPUTERS AND OPERATIONAL RESEARCH TECHNIQUES	144
20	The computer – Operational research FINANCIAL MATTERS Budgetary control – Unit costs – Capital and revenue	150
21	ELEMENTARY PSYCHOLOGY Training – Leadership – Human groups	159
22	THE MECHANICS OF PERSONNEL CONTROL Clear organization – Job descriptions – Job appraisal	172
23	THE MANAGER'S PERSONAL QUALITIES	179
	Index	185

1. Warehousing and the management function

Warehousing is very closely linked with distribution and is a muchneglected area of business study. We like the term by which it was referred to in an article in *The Financial Times*, when distribution was described as the 'last frontier for cost reduction'. We do not agree that it really is the 'last frontier', but, nevertheless, it is a frontier which has been forgotten; we hope that this work will increase the awareness of its existence, will inspire managers to make the attempt to tackle the problems which exist, and will give them many ideas on how the attack should be made.

It is natural that, when we approach a largely unknown territory, there will be fields for conjecture; that the methods of attack and even the terrain itself will open up areas for controversial ideas and conclusions; but this is inevitable. No two campaigners will see the problem in the same light and, certain it is, that they would not attack the sectors in the same way. What is necessary is to organize our thinking so that due reconnaisance can be made and we can think of all that is likely to be involved. Thus, if we are made sensitive of the need to look closer at something, even if we disagree with the conclusions which have been arrived at, then the provocation to do so has been justified.

What has not hitherto been properly understood is that millions of pounds are being lost because of a failure to see what is happening. When goods are idle, no matter for what purpose, energy is locked up. Goods in themselves are represented by value which can be expressed in financial terms and the space which they take up can also be represented in financial terms. The total amount of money represented by unused stocks of finished items, partly finished goods, and raw materials in the whole world must be fantastic. Most of the goods which lie in this state are there for the purpose of ultimately filling a demand somewhere. The fact that they have been arrested in the progress to their destination, whatever this may be, should be a

2 Warehouse Management

cause for enquiry because this puts up their costs, but does not add to their value. Furthermore, those goods which are on the move should be examined to see if they can be moved more quickly because this itself will release financial energy.

Great Britain has suffered a balance of payments problem. The problem could be largely solved by an attack on the slow movement of goods in the distribution set-up. This entails a study of the physical movement of the goods and materials and an investigation into the efficient use of warehouses and storage facilities of all kinds. A serious attack would serve two purposes: firstly, a reduction of the total inventory, which would lead to a reduction of imports for a while and this would build up financial reserves and, secondly, capital would be released to re-equip and modernize our industries.

The drive to release these resources of financial energy needs to be fostered by all organizations which hold stores of any kind whether they be raw materials, partly finished goods, finished goods, tools which are held in reserve, and so on. This applies whether these goods lie in stores, in factories, in warehouses, retail stores and shops, and even those which lie in schools, offices, etc. Wherever stocks and reserves of any kind exist, it is certain that there is room for some sort of economy.

This book is designed to stimulate thinking about this enormous problem; indeed, it is the *duty* of those who are aware of the problem to draw the attention of all responsible people to this much-neglected area, and to point out how the problems should be tackled.

Let us see why this area has been neglected and why it is likely to continue to be so unless there is a change of heart.

As with other areas of neglect in the business field, the 'stores' has been regarded as an unnecessary expense. It has been thought of as an evil which must be suffered and has been thought of as 'non-producing'. Furthermore, in those sections of business life where large stocks are held (mainly in the distributive industry), the problem has been under the care of 'administrators'. The approach which they have explored has not been the *engineering* one. Goods movement is an engineering matter – not an administrative one.

Here, for the sake of illustration, we would generalize and say that the difference between the administrator and the engineer is that the administrator thinks of physical goods in terms of their being reduced to numbers and of those numbers being written on paper. For him the physical items are an avoidable fact of life! On the other hand, the engineer sees the goods and their movement in terms of the real physical characteristics such as weight, size, bulkiness, viscosity, and so on. The administrator will look for economies in terms of the paperwork, and the engineer will look for them in terms of the physical work. Surely, both aspects of the activity must be considered, but the goods themselves are the first priority and the documentation is only a reflection of all that goes on in the warehouse.

One of the troubles of our complicated business existence is that we are too specialized. So rarely do we encounter the businessman who can take a panoramic view of his business. With the increasing complexity of departmentalization, and of individual 'functions' in a business, the specialist has to spend quite a lot of his life keeping up with change within his functional activity and the consequence is a tendency for him to become insular. Here is a case for going back to first principles: when we see what organization is all about, we should perceive the solution.

We organize a body so that we can isolate each separate activity and examine it in more detail. We take each separate part, give it a name, and put it under a microscope to find out more about it. After this, we get a man, attach a name to him so that he becomes part of the process, and he spends his whole time finding out more about it. Up to a point, this is good because with his thoughts and energies uncluttered by considerations of the other activities, he can probe deeper into the problems which beset that particular function and try to find solutions to them. But generally we find that the more deeply he probes, the more he forgets that he is part of a whole, and the more he tends to think of his own activity as an end in itself.

It is this 'functionalism' which has brought with it the seeds of destruction of many a business enterprise, but we do not wish at this stage to go further into this matter except to enter here a caveat. We would ask all of our 'departmentalized' colleagues to remember that we are part of a whole process and that, having explored the problems within our own functions and found some solutions, we should then see how they affect the rest of the organization. We must arrive at a point which the Americans call the 'total concept'.

It is so hard when trying to explain one's conclusions to move away from what may be called 'generalizations'. After considering a problem, we arrive at a definite point and make a statement. This statement always carries within itself its exceptions and therefore the conclusion has its own weaknesses. Often the consequence is that we destroy a good idea because of a contrary small detail.

Because the solutions to business problems cannot always be

4 Warehouse Management

resolved down to a set of rules, a book of this nature must, at certain points, pose open-ended questions. Statements made by an author can only set out his attitude in approaching the problems under certain conditions and within certain environments. It is not necessarily a bad thing if the reader is pulled up with a jerk and forced to disagree; he is thereby compelled to think about the matter and to draw his own conclusions. In this way he has made his own contribution to the subject and he really does learn something in the process.

Management is a total concept, being at all times a philosophy having, as roots, a deep constant curiosity; as its trunk a unity of purpose; its branches extending over every part of life; and the whole time issuing, as its fruit, new ideas for further exploration. No manager can be perfect, for no man can contain within his nature the many desirable qualities such as character, intellect, firmness, gentleness, single-mindedness, flexibility, and so on. What he can do, however, is to know the extent of the field of knowledge so that his aspirations towards excellence can find nourishment.

2. Warehousing and warehouses

WAREHOUSE (noun): building used for the storage of merchandise; warehouse (verb trans.): store in a warehouse.

We have to accept this definition as being too narrow for our purposes, because in business the operations which we perform in a warehouse are performed also in other areas of business activity. We need to examine the storage of goods other than merchandise and in this context we may not call the building in which we do these things the 'warehouse'. Later on, we shall draw similarities between warehousing and the transmission of electricity, or the running of traffic along a road, and in this sense there would seem to be no similarity between the dictionary word and the way in which we use it.

In the broadest sense we set out to discuss the movement and handling of materials and finished goods. They may have to stop in their journey for one purpose or another and the effects of their having stopped are to be examined, but before we do this we should ask ourselves whether they *need* to be stopped; whether they need to be stopped so often; whether their speed of progress can be increased; and whether the system we use to move them can be improved.

We consider as a common problem all that is involved in the need to get goods from somewhere and, further, what we have to do if there is a need to hold them for some purpose and then pass them somewhere else.

This involves examining four aspects:

1. The characteristics of the goods (whether solid, liquid, or gas; or whether they are soft, perishable, rigid, heavy, or high value or low; or the relationship of their value to their density) and the relationship between their characteristics.

6 Warehouse Management

- 2. The source from which the goods are received and how they are conveyed.
- 3. What is to happen to them in the warehouse or place where they have been stopped.
- 4. Their ultimate destination, who wants them, and what for.

STORAGE BUILDINGS

These factors have the greatest influence on such matters as how the goods are handled, the siting of the building, and the design of the repository. The following are the various kinds of store wherein the same need is satisfied, and therefore the same process is taking place but, in fact, there has to be a difference in *method*.

MANUFACTURERS

Operations store. This is a storehouse where the raw materials are kept. Here also might be kept partly finished or finished goods as well as general work-in-progress. These items are being held ready for absorption into the manufacturing process itself.

Ancillary storage. This could be an annexed workshop which is sited near the production processes to supply jigs tools, lubricants, or any article which might be needed for the factory or manufacturing process which is not absorbed into the finished product. The articles are held for use and then returned to store.

Dispatch storage. This is the store, dispatch department – call it what you will – where goods are held prior to dispatch from the factory. It might, for instance, be called the 'finished goods store'.

Seasonal storage. In certain industries demand causes wide tolerances in the quantity of stocks to be held and this may entail the hire of space.

WHOLESALERS AND MERCHANTS

These businesses generally come under one or other of two categories: those who buy finished goods in large quantities and 'break bulk' for one purpose or another, and those who import or buy from home suppliers certain goods for resale. In the latter case, the commonest activities involved are the receipt and transfer of goods in large bulk.

Wholesalers in certain industries do provide a form of self-service

7

warehousing facility, where warehousing is undertaken and customers call at the premises to select and themselves take away the goods.

Multiple retailers would come under this category where they distribute to their branches from a central warehouse. In effect they are giving a wholesaling service to their branches.

RETAILERS AND DEPARTMENTAL STORES

This means the whole gamut of retail organizations from the small shop and supermarket to the large chain store and 'vertically organized' manufacturing groups.

CENTRAL AND LOCAL GOVERNMENT SERVICE UNITS

Very large public undertakings and the nationalized industries hold vast stores of goods for redistribution.

PUBLIC AND PRIVATELY OWNED WAREHOUSES

This includes depositories and warehouses where goods and materials belonging to other people are stored on a temporary basis.

If we consider all these enterprises and take into account the large numbers of sub-stores and cubby-holes where goods are stored, the enormous values which must be represented by materials, articles, and space can be realized.

Envisaging these values and bearing in mind the economic implications of efficient materials handling and of good warehousing, we see how this much-neglected aspect of industrial, commercial, and other activity can repay careful study. Think of the warehouses, wharfs, railway wagons, large vehicles, ships, and aircraft – all of which together with stores and other distributing media hold goods and materials which have not reached their source of demand, the consumer.

If this vast amount of produce could be handled more efficiently and more quickly, energy in the form of space, money, labour, machinery, and so on, would be released for other purposes.

This argument can be narrowed down to the individual business, commercial or local government unit, and it will be understood that idle stocks lock up energy. We must constantly be seeking ways to unlock this energy for use for other purposes within the organization. We must also consider all sources of potential loss, such as deterioration of stocks, pilferages, redundancy, and obsolescence.

8

LIMITATIONS OF FINANCIAL RECORDS

Hitherto in capitalist countries businesses have indicated their efficiency by means of the results shown in their profit-and-loss account. This has been considered as the best (on some occasions, the only) way to measure the efficiency of the activity. However, this method of converting our actions and of expressing them in financial terms is now becoming questioned and we are looking for more precise ways to measure and compare efficiency; but they are the guide which we are at present using and it is to the financial records that we now fly to get an indication. Unfortunately, they have several weaknesses and it is as well to know what they are so that we can try to devise other means of ascertaining whether our methods are in any way wasteful. An example of the inefficiency of the profit-andloss account is that it does not give us a yardstick of what the minimum cost of an activity should be. We really need to know what minimum costs should be involved in an activity so that we can learn to locate areas of waste and eliminate them. The profit-and-loss account shows us whether we have made a profit or a loss in financial terms but we cannot discern from it whether we have made the absolute maximum profit which it is possible to make.

While not decrying the value of cost accounting, we must look into other ways to discover and cut out waste. Certain it is that the breakdown of areas of work enables us to examine activities against each other and against the same activity on a comparative basis in terms of time, etc., and thus to root out areas of inefficiency; but the only way to aspire to improvement through the cost accounts is to take the total activity. We must compare one period in time with another and examine the changes which have taken place. In other words, in a particular department, or even in the total work of the enterprise. there could be a flaw in our endeavours but the cost accounts would not show this, any more than the financial accounts would. We must. in fact, find out the very best way to do a job and, if we reach maximum efficiency, then automatically our actions must yield the maximum profit. The financial records only reflect what we have done and give us some indications whether we have been more efficient on one occasion than another.

There is much to be done to get the maximum benefit from our resources and more and more sophisticated instruments (such as computers) are being invented and discovered to enable us to do this.

We must not be satisfied with conventional methods. Everything which has been done before, every method we use must be challenged and forced to justify its validity.

The obvious start is the question 'is this activity really necessary?' For example, 'do we need accounts, do we need cost accounts? Will the computer provide us with direct information which will give us a better picture of the relative efficiency of an action than when it has been converted into financial terms?' - and so on.

The right frame of mind is where we are asking questions, insisting on answers, and finding ways of checking the answers. All resources are limited - time, space, money, labour, materials - but the most urgently needed resource is the one which is scarcest, that of ideas. The only way to get ideas is to ask questions and to doubt our own eves, doubt our own reasoning processes, put everything under enquiry. Make a habit of it and ideas will begin to come.

3. Scarce resources

We are trying to make the maximum use of scarce resources. These resources are not only material means, but include such abstract things as ideas and managerial ability; they include probably the most valuable resource of all – time.

As a rule, when we think of scarcity, we think only of the tangible things such as materials and money, but in business we have to husband the use of many other scarce items such as, for example, the accumulated knowhow of a team which has been working together for a very long time. (What is it worth to prevent the breaking up of such a team?)

MEASUREMENT THE BASIS OF CONTROL

To attempt to prevent waste of resources we must analyse them to see if in some way they can be measured. Measurement gives us a basis for comparison and thus points the way to control but, unfortunately not all resources can be measured. How, for instance, is it possible to measure the value of the services of the managing director of a business concern whose work for that unit varies from day to day, and even from moment to moment? The need for his ability to lead the Company is one which cannot be doubted, but how do we measure this to maximize the benefits to be derived from it?

We can only provide the environment in which this kind of resource is likely to produce of its best and *hope* that the results will be forthcoming.

Given that we cannot measure all resources and the use of them, we must examine those resources which can be measured and find out the most convenient way to measure them in order that a framework of comparison can be constructed. From this we can calculate the rate of consumption or usage so as to find economical ways to employ them.

Throughout this work we shall be looking at different ways to use measurement and later on we shall briefly refer to the use of the computer, but today it should not be necessary to harp on the fact that many things are being resolved down so that they can be represented mathematically. The present instrument for converting the information is this versatile machine.

ANALYSIS OF RESOURCES

Let us look at the warehouse so that we can estimate what scarce resources are connected with it and are contained within its bounds. It must be borne in mind that, at base, the warehouse is a vehicle to serve a particular purpose and is only part of some sort of process. Thus although we seek to isolate it from other activities so that we can examine it more closely, we still have to keep in mind its function within the total set-up.

The warehouse itself occupies space. A building may not necessarily be involved: it could, for example, be a builder's yard in the open air in which materials are stored. All activities which relate to storage are closely linked with a warehousing function, so even this type of business has to be seen in the same light, that is, as having the same problems.

Let us now see the building in our mind's eye. We must never see it as a box but rather as a *tube* and, it could be said, 'they have their exits and their entrances'. Even though the exit and the entrance must perforce on occasions be at the same place, it is essential to bear in mind that two processes take place – the coming in and the going out. We have before us a space, often enclosed by a building, in which we are going to perform some sort of activity. The building itself has a cubic capacity which can be measured in cubic metres or cubic feet and thus we have located one of the units of measurement.

The building has had to be paid for and at the time of purchase the amount which has been expended to buy it is recorded in the books of the company. The money value is another unit of measurement because, in effect, it constitutes the comparative value of the building with the value of other buildings at the time of its purchase.

Some time later, the building may be unsuitable and when we look at its value for the purpose of disposal, we find that its value in terms of money has changed. We will not dwell on this fact for the moment but it has to be known.

To be useful for the purpose of warehousing or storage, the building has to contain inherent advantages, or these have to be