



PART I

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Origin and Growth of Materials Management in Indian Healthcare Industry

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CHAPTER - 1



Origin and Growth of Materials Management in Indian Healthcare Industry

INTRODUCTION

Change is the only constant in the life. A dynamic profession like Materials Management evolves continuously and absorbs new ideas, concepts and philosophies. It also develops new tools and techniques to cope with the ever changing environment. In fact, the resilience of a profession or academic discipline stems from its ability to continuously adapt and improvise. Over the past quarter of a century, materials management in India has witnessed changes in cataclysmic propositions and transformed from a mere clerical, administrative function into a strategic business initiative. However, between David's slingshot and an intercontinental ballistic missile, the industrial Materials Management was scientifically systemized. The future - The confluence of bio-technology and Information Technology is the harbinger of the future. It will make way for neural networks and systems-on-chips embedded into human skin to transform the capability of managers beyond comprehension; with bated breath, we await the exciting future.

ORIGIN OF MATERIALS MANAGEMENT

Men need goods and services from others in order to live in comfort. As a matter of fact, that is what distinguishes the human beings from animals. The more they are civilized, the more such needs arise. At the beginning of human history, the basic needs that were in demand were met by usurpation or theft and services through slavery. Unfortunately, these practices are still in existence in some parts of the world. When mankind became more civilized and less barbaric, the needs were met at first stage by barter or by donation. Man spent millions of years hunting for his food. Then he learnt to use the skin of the animals for clothing. Slowly he found the advantages of agriculture. Some became adept at weaving, others in pottery, and a few in metal working. The medium of exchange was represented by standard objects such as food grains, animals, metals, precious stones, etc. the "Nexum" or Manicipatio the Greeks used 'cattle' as medium of exchange. The Manicipatio in Rome was accomplished through the "Libripens", who could be considered as the material administrators. To facilitate exchange, the libripens introduced metals which later lead

to minting of coins that they called 'Pecunia' ('cattle' in Latin). Hence, it has been observed that we owe the coin to the Materials Manager and thus he became more and more necessary. During the third stage, the Romans considered the "Emptio Venditio" i.e., instead of coin at sight, a combined price; and the contract of effective barter became consensual contract of sales and purchases. There was no industry in an organized manner in the medieval ages. The purchase function achieved specialization quite early in man's history. The development of man can be directly correlated to the development of the purchasing function. In due course, man realized that it would be to his advantage, if instead of learning all the trades, he specialized in one trade and purchased the other products in return for what he produced, and thus the barter system developed. As the specialization increased, he found it difficult to fix values for the products to facilitate exchange. To ease the transactions, money came in to existence. In fact, money itself has come to represent only what it can buy. Once specialization in trade was developed and money was introduced, the development of mankind was really rapid. Man could purchase his requirement of goods and services and gain satisfaction. This process was extended to the organizations he built. As there was a ready market for specialized goods and services, economic development became viable that resulted in the growth of technology. Thus purchasing is always an essential part of man's activities and it forms the very basis of his development. The earliest example of purchase order dates back to 2500 BC. It was a clay tablet of Babylonian origin and was meant for supply of fragrant oil to be delivered in lots of 50 JARS at 15 days interval. (Menon K.S., Purchasing and Inventory Control, A.H. Wheeler and Co. 1993)

Towards the end of 17th century, King Louis XIV of France created a new position in French army; "Marechal General des Logis" (General Marshall of logistics), who was responsible for supply and transport of materials including selection of routes. Therefore, the term 'Logistics' approximately corresponds to the modern concept of materials management. The importance of position can be noticed from the title "Marechal" (Marshall). The entrepreneur created new ideas and put to practice by mobilizing himself the necessary capital, and managed personnel, production, sales and finance. **Later on, over a period of time, he divested himself one after other functions to others in the following fashion:**

- Finance Department including accounting and auditing took care of the finances.
- Human Resources Department or Personnel Department took care of personnel staff control and industrial relations.
- The relative importance of sales, production, finance and staff managers has varied according to economic cycles, kind of businesses and the culture of enterprises.

However, the materials function was not delegated to others and he managed it himself as he considered it vital. Thus the four areas established themselves as basic functions. Materials today are the life blood of industry without which no organization can operate.

In the initial stages of industrial evolution, productivity hardly increased. Availability of manpower far exceeded machine power. Emphasis was on men as the first source of productive

power. Before the 20th century, machines and the manufacturing processes were simple, uncomplicated, though slow. Materials were simple and available in plenty and at low costs. Distribution was confined to a limited area. Location of manufacturing units close to the sources of cheap raw materials was one of pre-requisites to production. Introduction of better and newer machines coupled with scientific management to arrange and schedule them led to the factory system, which in turn resulted in many industrial changes and inventions, changing the whole complex of manufacturing. Gradually materials became more complex, labour more specialized and mechanization increased continuously. The growing complexity of materials combined with its scarcity and high cost and the increasing volume of production naturally shifted the importance to "Materials" as it became the largest element in the total cost of the product. This shift in the relative value of materials making it the largest single element in the total cost of production continues even today.

In India, the concept of materials management was in vogue several centuries back. Kautilya's Arthashastra is one such work of literature wherein the Indians were said to have mastered the art of materials management. In his great work "Ashtadhyayi", Panini the ancient Indian grammarian referred to many great storage vessels like the 6 foot high cylindrical vessel made of earth called 'kusala', 'kumba', with a narrow mouth, 'Kupa' resembling a well, 'Sala' a masonry structure with an opening called 'Bila' etc. In 'Arthashastra', **Kautilya, the famous Raj guru of King Chandragupta Maurya** gives a detailed description of the storage practices followed during the latter's reign. The Mauryan regime had constructed ships with facilities to store huge quantities of food grains, which were also engaged in foreign trade. The renowned minister set out well defined duties of the keepers of the Crown storehouses. The principle keeper was called 'Dhanyadhipa' and the qualification needed to hold that position was to be an expert in determining the varieties and grades of the grains as also the techniques to store them in a healthy state and to protect them from pests, rodents etc.

In the 19th century, Napoleon carried all of his supplies, including food, in the form of dried products. His armies were spread out and communication methods had to be devised to coordinate the movement of men, equipment, and supplies. He used sophisticated methods for the same. He never would have achieved the success that he had if he had not been concerned with the logistics of obtaining and moving supplies. Thus was born the concept of "material". Modern armies still practice this logistics of material.

Industry before the 19th century was confined to the home. Each family was either given or bought supplies from which it created desired products. Mechanization began in that century and gave rise to factories, with people leaving their homes to work in central locations. Textile mills of this era were to be the home of the first primitive computer. This was not successful, but the need had been identified.

In Indian industry, the concept of Stores Management did not receive its due recognition till 1980's though the concepts of scientific stores management were in vogue during the Gupta period. The new marketing concepts such as **customer satisfaction, customer delight, customer surprise brought in their way that industry has to deliver "more for less"**. Customers are demanding, no

Stock outs, shorter lead times, frequent deliveries and delivery within specified time frame. In addition, the customers are expecting value added services such as bar coding of secondary containers, shrink wrapping pallets, drop shipment and even direct door delivery at the same cost or even lower cost. This pressure heightens service from stores manager for improvement, cost and service not only from customers but also from top managers.

In the early days of the industrial revolution, the industrialists were not formally acquainted with the principles of materials management. The three decades that followed industrial revolution marked the advent of modern production. The introduction of artificial source of power meant that factories could be located away from rivers and coastal areas. Electricity, Steel and Gas energy could run large number of machines. A deluge of inventions viz., the automobiles and trucks, radio, telephone, airplane and sophistication of machine tools has brought new vistas to industry and commerce. Mass production was incorporated in the factories all over and these soon developed into well designed plants. Production increased in complexity and labour took on new importance.

The most significant concept evolved in that period was the recognition of need for an operating line and servicing staff. **F W Taylor**, the father of scientific or modern management took the first major step towards functional organization and staff specialist. Taylor provided for the materials management function a long range planning, production control and scheduling, as well as other operational tools, such as quality control, industrial engineering, cost control and standardization of operations and procedures (*Ballot 1971*). *HL Gangt, refined Taylor's production control.*

There are quite a few authors who believe that materials management is an extension of purchasing function and they say " when most of the functions related to materials management are grouped together organizationally, the purchasing manager becomes a materials manager in fact, if not entitled. Eventually management recognized that function being performed in each of all departments is no longer purchasing, but something else; materials management. They recognized this by changing purchase manager to the title of materials managers." (**Hammer 1970**).

Most of the present materials managers have developed from purchasing executives. It is not surprising therefore that they regard materials management is logical extension of purchasing function (*Datta 1978*).

Even as late as 1900, when the United States and the leading European nations were already established as industrialized nations, the concept of separate and independent materials activity was novel to most managers. Of course, subsequent research by **Harold E. Fearon and John H. Hoagland** showed that, in mining firms at least, purchasing existed as a separate activity as early as 1832, and was very common in railroad firms by 1887. However, it came to manufacturing firms somewhat later and unfortunately some firms did not have strong independent purchasing or materials activities as late as the 1950's. By the end of 50's, the concept of coordinated administration of materials function became overwhelmingly important, placing heavy emphasis on both value and control.

During World War II, industries had no selling problem. Their success depended very much on their ability to obtain raw materials to keep their factories working. This has led to recognition of materials management as a specialized managerial function. The fact was no longer contested. It allowed considerable improvement of materials management staff. "Materials Management" gained new prestige with the book "**Crusade in Europe**" written by **General Eisenhower**, former President of U.S.A. He states that, "The complete success in modern industries depends on efficient organization of the materials service; an efficient material service is one of the most astonishing of all brilliant achievements".

In the middle of the 1960's, bank interest rates began to rise all over the world from 3 to 4 percent in 1950's to 9 to 16 percent. Keeping excessive inventory under such circumstances was a luxury that leads many companies to bankruptcy. Inventory management became an indispensable item in competition. The Japanese were the precursors. During the golden jubilee convention of National Association of Purchasing Agents of USA held in 1965, the US Secretary of Commerce called "Purchasing" a major factor keeping the country competitive in an increasingly tough old market. Materials management is termed as "**The last gold mine**" for business executives. It is indeed the last of specialized functions to be given the responsibility and authority for making major contributions to business profits. And the efficiency or the lack of it, with which this vital function is carried out, will make or mark the success of the organization.

In 1970's, commodities were still in shortage and prices increased abnormally culminating with oil embargo in 1973. Source marketing appeared. It became evident that **systemized scientific materials management was in unquestionable function in overall management.**

This led to:

- Progressive elimination of subordination.
- Evolution of materials management in several aspects, professional and functional.
- Historical evolution within wider context

Evolution of Materials Management

Table 1.1 Evolution of materials management function

Perception of	Primitive	1 st evolution	2 nd evolution	Present development
Status of materials management	Errand boy	Serving production	Market experts	Managers of 60 percent of total expenses
Materials management staff	Glorified office boy	Bureaucrat	Commerce expert in marketing	Negotiator engineer economist lawyer
Possibilities of improvement in Materials Management	Dead end	Purchasing aid, buyer senior buyer	Section chief Dept chief Manager	Executive Director Vice President
Usefulness of Materials Management	Expenses only	Avoid shortage, demobilize inventory	Source marketing strategic planning	Contributor for profit

Thus today materials are life blood of an industry. Materials management is basic part of any organization that produces a product or service of economic value. It is not only essential for profit making industries but also for service enterprises, both in public and private sectors of economy.

Very soon, materials managers will have a career superior to a vice president. The decades of sixties was an era of industrialization, India saw a trend towards improvement in production capabilities. In seventies, major emphasis shifted to marketing and selling. The decade of eighties rediscovered need for resources conservation. It brought a realization that commodity shortages have a severe impact on profitability. In the current decade, the economic scenario in India is changing at breathtaking pace. The changes in various areas such as fiscal, trade policy reforms, industrial reforms etc., are aimed at stimulating growth.

The opening up of the economy to global competition is bound to throw up unforeseen challenges to Materials Management professionals in this country. As the walls of protectionism are demolished, the foreign technology and goods flow in. Materials Management will perform a more and more important role in the future. Today's entrepreneur emphasizes "Research and Modernization". New products will demand new suppliers; new technical and economical supply problems will have to be solved. Tendency to concentration, assisted by fusions, amalgamation and takeovers, etc. will demand better negotiators and a high level relationship, of the same status as those of suppliers.

Complexity of organizations and the use of IT has increased, thus increasing the need for well trained and competent Materials Managers. Shortage of many primary materials and sources of energy will demand alternatives. These may be found through "Value Analysis". Industry and commerce will not only need more Material Managers, but also those who are better prepared and more efficient and agile. The young managers will have good opportunities for progressing, according to their ambitions, ability and efforts. Well trained and efficient Material Managers will earn higher salaries and perks because they are important executives. Considering the nature and complexities of modern day materials management, it is difficult to lay down any particular academic qualification as a necessary professional requirement of a good materials manager.

National Association of Purchasing Agents appointed **Harbridge House Consultants Boston**, Massachusetts in the year 1960 to make a study on Materials Management. Harbridge Consultants made a study and were unable to arrive at comprehensive definition of Materials Management and concluded that, "too many managers simply do not know what materials management was". **Dean S. Ammer says, "Every study that has been made indicated that there is no agreement as to precisely what activities should be undertaken by the materials manager."**

A survey of literature on Materials Management indicates that there are as many definitions of Materials Management. Different authors included different functions in materials management. However all the authors are unanimous in Materials Management include basic three functions purchasing, stores, inventory control (which includes sub functions of planning, handling, and distribution).

There are those who say the United States would not have won the World War II if the concept of materials management had not been used in the aircraft industry, where virtually overnight the nation was able to develop and build warplanes by thousands. There has always been this connection between the military and distribution of supplies. Today, modern industries could not realize profits, and thus could not survive, if not for the use of sophisticated forms of materials management, such as materials requirements planning.

EVOLUTION OF PURCHASING IN INDIAN INDUSTRY

In order to have a better appreciation of evolution of purchasing function in Indian industry, it is helpful to first understand the historical role of purchasing and its development. At the turn of the twentieth century, in small or newer businesses, the owners controlled all buying. It was one of the many duties they performed. Clerical detail is inherent in buying. As the company expanded, it was necessary to have someone pick up this clerical workload; however buying authority remained with the owner. As the operations of companies increased; the buying function was assigned to the production department, since it consumed most purchased materials in the manufacturing process. The clear trend to bifurcate purchasing from production was evidenced in 1940's. Studies towards the end of this period show the purchasing officer reporting to the president or a vice president in 70 percent of the firms surveyed. By the late 1950's, the trend is even clearer. A survey of 350 companies shows the purchasing head reporting to top management; about 95 per cent of the time to the president, a vice president or executive vice president (38 per cent), the general manager (36 per cent), the treasurer (15 per cent), the production vice president (3 per cent), or to the controller (3 per cent), director of manufacturing, production manager, or plant supervisor (5 per cent). There has been little understanding of purchasing role by non purchasing executives. This was probably because the function previously had not been so important, and purchasing people were generally not considered the top talent in an organization. Purchasing therefore has been relegated to a position subordinate to other departments, especially production. Now, fortunately, this practice is changing due to a gradual recognition that effective purchasing requires individuals with specialized skills, knowledge, and ability to cope with the changing conditions that beset modern business.

"The key to efficient and effective industrial marketing is not the supplier but the buyer." This statement by **Peter F Drucker**, one of America's foremost management spokesmen, highlights a growing awareness of the role of purchasing activities in our business society. Yet for all the thousands of books written on marketing, there is but a handful on the buying function. (Peter Drucker, "The Economics of Dark Continent;" fortune magazine, 1962) Mr. Drucker says further, "The industrial purchaser has to know his own business, of course, and the progress made here in the last few years is all to the good. He has to know what the product or supply he buys is supposed to contribute to his company's end results, has to buy it at cost per unit of his own output rather than just by the price tag. But he also needs to know just as much about the structure of the supplier industry and its economics." Pointing a finger at purchasing performance, he continues, "... The buyer of industrial product and supplies is in many cases semi literate, or even illiterate, in a business

sense." Although these words reflect an oversimplification of the state of the purchasing art, here is an awareness both of the tremendous value of the purchasing function, and of the limitation of those in the field. Hospitals subscribe to the importance of good purchasing, yet must admit to an overall weakness on the part of individuals practising its skills. One may argue that it isn't necessary to have a purchasing department. Whether, one exists or not, the buying function must be performed. Buying can be done by anyone in engineering, production, finance, or management. However, during the first half of the 20th century, most businesses found, through experience, that it is desirable to establish a separate department, known as purchasing, to handle procurement activity.

One more proof of top management's recognition of the purchasing function is to be found in recent statements by several of industry's foremost statesman. **Roge M. Blough**, Chairman of the board of United States Steel, has said: "It seems to me that you [purchasing men] hold one of the master keys to progress and growth in American industry.... You spend nearly a quarter trillion dollars each year in the market place. Can we hope even to comprehend the effect that your purchasing decisions actually have upon the nation and its economy, the spur that you along with others in your organization can give, or fail to give, to the processes of innovation, and the power you have to influence America's competitive position in the world?"

Today's purchasing manager must be one of the most knowledgeable managers in his company. Unless he understands enough design, engineering, production, and marketing and related functions in sufficient detail, he can't possibly do his job. Purchasing people must be brought into the picture in the earliest stages of design, engineering, and production. Frequently, they are able to make creative suggestions and studies that result in improved products, faster production schedules, even better design and appearance. Realistically, the hard necessities of price considerations will probably always come first. But, more and more companies are realizing that creative purchasing practices can result in more than just saving money. They can make money as well. Top management will give purchasing more authority as it comes to realize that, without control, purchasing can't take the necessary action to prevent unnecessary costs and losses.

RECENT TRENDS IN MATERIALS MANAGEMENT IN THE INDIAN CONTEXT

During the second half of the 1970's, the country was still with the mindset of 'License, Quota, and Permit Raj'. National planning was based on the 5-year plans as per the blueprint given by the first Prime Minister of India Shri Jawaharlal Nehru. We were trying to practise the socialistic pattern of economy as in the erstwhile USSR. The western ideas of capitalism, free competition and market driven economy were considered too imperialistic and materialistic for our society. At the national level, **the Indian National Congress (INC)** was the sole ruling party up to 1977 and its leader, the charismatic **Mrs. Indira Gandhi**, the ideal Prime Minister. All this suddenly changed due to the backlash of national emergency in 1977. The first opposition coalition came to power at the centre in the national elections that followed the lifting of emergency. It can be said to be the beginning of coalition politics at the national level. During this period of political upheavals and

uncertainty, the corporate managers had to evolve the strategic plans within the framework of national policy making. Import licensing restrictions had to be contended with. Industrial licensing was a very complicated exercise in the labyrinth of corridors of power. Hence in 1976, the theme of national planning in so far as it concerned Materials Management was industrial licensing.

All the while it was also being felt that bureaucratic controls were throttling national growth and preventing the country from achieving prosperity and higher standard of living for its teeming millions. Hence in the year 1977, the predominant theme was national growth and the contributions which the profession of MM could possibly make to accelerate the process of growth, by augmenting utilization of installed capacity and improvement in industrial productivity.

There was a strong perception in the Planning Commission at that time that the twin problems of underdevelopment and unemployment could be solved by encouraging ancillaries and small scale industries. When the Janata Party came to power, post emergency, they gave a further fillip to the national endeavour for small scale sector by reserving many more items for exclusive manufacture by Small Scale Industries (SSI) and creating a new 'tiny' sector. 'MM and ancillary Development' was the major issue.

Around this time, severe materials shortages began to be felt by several sectors of the Indian industry, particularly those that are dependent on petroleum products and petrochemicals. The challenge to MM in the years ahead was perceived as coping with materials shortages. The Government in 1979 and 1980 tried to take a peek at the immediate future and evolve strategies for procurement of hard-to-buy materials.

Materials Management during 1981-85

At the commencement of the decade of 80's, the Materials Management (MM) professionals in India and all over the world started taking a fresh look at the relevance of their profession to the overall objectives of the corporations which they were working for. It was realized that MM cannot exist only in an intellectual plane and insulate itself from the mainstream of corporate life. MM in 1981 concentrated on the theme of "Materials Management and Corporate Objectives". The professionals strongly urged the Materials Managers to be conscious to the constraints imposed on their profession by the corporate objectives. One of the important objectives that emerged was in the area of cost control. With double digit inflation all around, costs were rapidly getting out of control. This led to rising prices of finished products and thus came into existence the upward price spiral. The theme of "Curbing Inflation by Efficient Materials Management" was the flavour of the day. It soon became apparent that cost control of incoming materials was desirable but just not sufficient. If the companies were to prosper and be competitive too, the productivity must be maintained at a higher level and improved upon continuously. This can be possible only by making the inputs available at the right time and right place. In capital intensive industries, spare parts play a very important role in utilization of plant and machinery and in productivity enhancement. It was rightly felt that effective MM could boost productivity. By 1984, the theme was "Inventory

Management for Corporate Results". It clearly concluded that corporate results could only be achieved through efficient and effective Materials Management.

Materials Management during 1986 - 1990

By the year 1986, it was evident to the materials managers and to corporate think tanks that the old order was inexorably changing. The 21st century would be drastically different from anything witnessed in the history of mankind. MM professionals deliberated up on the theme of "Materials Management Challenges of 21st Century". The vital role that MM can play towards corporate profitability came to be the most important. Around that time, the impact of Information Technology was being felt on Materials Management, Information Systems throughout the world. Digital communications and Internet started penetrating in the Indian psyche. The World Wide Web was perceived as a source of all information, communication, advertising and source of potential suppliers of future. Keeping this in mind, the various aspects of Materials Management in the hi tech environment became important to materials managers of that time.

Materials Management during 1991 to 1996

Materials in the manufacturing sector constitute 50 to 70 percent of the total cost and savings would make the product competitive in the market. Wages and infrastructure facilities like power, freight and so on will continue to escalate; thus bringing pressure on controlling the cost of materials. Until total costs are controlled, the exports of our products will suffer, as they will not be internationally competitive. This will deny us the economies of scale. It has to be remembered that incentives for exports like cash compensatory support, duty drawbacks and so on will remain temporary palliatives, since the pressure on the government to reduce subsidy will remain strong.

Globalization essentially means that economic activity and business of a country do not remain confined within its political boundaries. Its companies have operations in several other countries and at the same time, they are not protected from external competition from other global companies. Such transnational companies (or stateless corporations) invest or carry on business in whichever part of the world where it is most profitable and not necessarily in the country of their origin.

This new trend has transformed the world economy. Economic globalization now marries the cheap capital of rich countries with the cheap skilled labour of developing countries to produce the most competitive goods. The great opportunity provided by globalization should combine cheap global capital with inexpensive Indian skills to take India to march ahead strategy.

The main challenge for Indian industry is to become globally competitive in terms of costs, quality, and delivery performance. **Today, it is not enough to be "First Class", our companies have to become "World Class".**

From the year 1994 onwards, Materials Management started relying more and more on Information Technology and the relationships among Information Technology, Materials Management, and corporate competitiveness. Information Technology can be of help to an organization

in many areas. The first of these areas is in cycle time reduction. Information Technology can do a great deal in speeding up business. Secondly, it can enhance service levels and is the best tool in improving customer satisfaction. Thirdly, world class manufacturing organizations would not have been possible without the advancements that have taken place in Information Technology, which is the prime mover to bring the corporate competitiveness and lastly, the decentralization of power.

SUPPLY CHAIN MANAGEMENT IN THE CYBER AGE

Supply Chain Management encompasses all elements of sourcing, indenting, procuring, production scheduling, order processing, inventory management, transportation, warehousing and customer service as well as the information and monitoring system. Supply Chain Management coordinates and integrates all these activities into a seamless process where all "partners" of the chain like vendors, carriers and third party logistic companies are 'links' in the chain. Chief executives are hard pressed to optimize sales growth, reduce costs, secure better working capital management and improve overall performance, productivity and profitability. Production should not rely solely on sales forecasts, but instead by synchronizing closely with customer orders. It is here that Information Technology has to play a significant role by giving an edge to logistics and link individual parts with the whole chain.

In the cyber age, cyber highways have become as important, if not more important than our highways. Worldwide websites E-mails and E-commerce will be the order of the day. Citizens are become worldwide citizens. E-commerce has matured and Information Technology companies are the new creators of economic value when supply chains will now become intelligent supply chains.

Increased use of Information Technology to enhance commerce and communication is predicted. This has enabled global sourcing, increased transaction speed and made geographical distance inconsequential. It enables each element of value chain to enhance customer's delight. Successful enterprises identify the potential of Supply Chain Management, taking the supplier base as partners of progress.

EVOLUTION OF MATERIALS MANAGEMENT IN THE HEALTHCARE INDUSTRY

Healthcare provision must be viewed as an industry like any other. Its products and underlying value systems are somewhat different but the basic managerial structures are no different. Techniques that improve performance in one industry must be evaluated for feasibility in others. Materials Management has been recognized as an effective tool in other industries for years. It is only a matter of time before its value is fully realized in healthcare. Hospitals should be viewed not only as a group of coordinated activities in a structure but also as a series of neighborhoods, each concerned with the acquisition, processing, and distribution of materials, as well as with the provision of diagnostic and treatment services related to patient care. These neighbourhoods, or departments, are relatively autonomous; yet exist together as if they were in a city. They all have the same underlying objective, which is to care for patients' medical needs. Their common goal must be to find the most efficient and effective way of achieving this basic objective:

At one time, hospital supplies were limited. Bed linen was changed infrequently. Food was brought to large patient wards in buckets. Each patient had a plate and a spoon, recyclable dressings, and a few medications. To complicate matters, supplies that were used on patients had to be cleaned, packaged, and sterilized for reuse. The need for these manufacturing functions led to the development of laundries and small, decentralized processing areas. As technology grew, a myriad of tests and procedures developed as a result of advances in anaesthesia, microbiology, and radiology. Each technological advance spawned a new stock of supplies necessary to support it. The need for supplies and equipment unique to healthcare gave rise to a profusion of manufacturers anxious to meet these requirements. Their needs and objectives sometimes were at odds with those of healthcare providers themselves. This led to high prices and unnecessarily large stocks of supplies. To cope with this situation, a new activity arose in healthcare institutions: the acquisition, storage, and distribution of materials. Unfortunately, these activities were often performed by persons who were neither trained nor interested in doing them effectively. However, in the 1970s, the sheer volume and cost of these activities reached a point where some hospitals began to adopt Materials Management concepts and practices. The single-source control system of inventory management, processing, and distribution of materials became the key to bringing order out of chaos.

A system can be defined as a logical sequence of concepts or components designed to accomplish a specific function efficiently. Material Management, therefore, qualifies as a system. Systems have the following components:

1. Inputs
2. Processes
3. Outputs
4. Controls

These components may be envisioned within the four Materials Management sub systems of procurement, inventory management, including acquisition, processing, and distribution. Feedback on the performance of this system needs to be monitored, and adjustments are to be made to its design and operation, so that a continuing cycle of logical and effective material related behaviour is established. This system of materials management is one of the elements that tie the total organization together. The concept of materials management must be integrated into the total operating philosophy of a hospital if that facility is to be efficient.

HOSPITAL MATERIALS MANAGEMENT AT PRESENT

A few years ago, it was common to find hospitals that did not use centralized Materials Management. As the economy tightened and regulatory and consumer constraints on the healthcare industry increased, more and more MM programmes came into existence. However, MM in the healthcare industry is still in the early stages of development in terms of being recognized as a

specific and credible discipline. It is true that increasing numbers of managers have graduate and postgraduate degrees and have studied the managerial and logistical techniques developed in other industries. However, the actual time spent in specifically studying healthcare MM has been generally insignificant. More materials managers are now reading books and journals devoted to this subject, attending seminars, joining professional associations, and taking certifying examinations. Thus, much of the structure and foundation of this discipline is in place. However, **materials managers still consider themselves as order takers, not direction setters.** They accept the idea that departments such as surgery, radiology, and laboratory are outside the realm of MM and that MM is only based on the implementation end of the hospital's long-range plan instead of being involved in its development. All the information and techniques related to the management of materials in this specific industry has not been synthesized into a common body of knowledge that can be identified and taught in colleges and universities. Next, the disparate professional organizations that represent the various aspects of healthcare MM have not been integrated into one unified professional body. There must always be effective representation of the specific interests of the special areas such as central processing, laundry, purchasing, etc. which are the different aspects of MM. If these managers are to obtain the required broad recognition and deep support, a unified body must represent them. Finally, materials managers, in the aggregate, have not been successful in proving to administrators, physicians, and board of directors that they are qualified, competent, and have earned the right to participate in the broad direction-setting process for their organizations. Many of them can effectively manage routine daily operations. They must also acquire the vision, expertise, and skill necessary to be accountable for the materials management of the total organization. Then their hospitals will be able to realize the full benefits of effective Materials Management.

FUTURE OF HOSPITAL MATERIALS MANAGEMENT

Great strides have been made since the mid 1980s in India. This field is at a normal, healthy point in its development. The levels of education and expertise of its materials managers are increasing. Performance and practices are becoming more standardized and it is gaining recognition. However, the challenges and opportunities of the coming years will be even greater. The measure of how fully managers realize the potential of their field will depend upon how assertively and effectively they grasp these opportunities and make them reality. Some trends are apparent and can serve as starting points for managers as they design future materials management programmes for their facilities.

Top Management Support

Every hospital must have a clear policy statement, issued by the chief executive officer and approved by the board of directors, that establishes firm support for, and a clear expectation that, materials management practices will be carried out effectively. This operating philosophy is to be handed down from the top of the organization. It will serve as the stimulus for all department heads to work with the materials manager in finding ways to improve their operations. It is also the basis

of a statement to vendors outlining the ground rules for doing business with the healthcare facility. It will serve as part of the conceptual framework for the organization's long range plan. More organizations are establishing corporate level positions, such as vice president, that will have total responsibility for the management of materials throughout the facility. This might involve direct control over 70 percent of the material resources and strong monitoring/consulting influence over the other 30 percent. Healthcare facilities spend crores of rupees each year on training and education activities. In the past, no attention was devoted to developing materials management personnel. As administrators gain complete realization of the total monetary impact of these manager's daily activity, more money will be devoted to training them to perform more effectively. There will be a greater need to develop both educators and training programmes. The selection of employees will receive greater attention. Staff level materials management jobs often have been regarded as entry-level positions, requiring little background. As a result, less than optimal selection procedures have sometimes been used. This has resulted in high investment in job training, inadequate performance, and high attrition rates. To obtain adequate return on the investment in training and development, hospitals must select employees with high potential and appropriate skills and characteristics. This has been implemented in the clinical departments for years and must be followed now in materials management. The environment within MM departments is expected to become more motivational. The value of investing in effective physical layouts, equipment, and systems will be increasingly apparent. Employees will be trained to make better use of these resources. MM employees' contribution to the patient care effort should be recognized more often. Patients, physicians, nurses, and others should realize that when the facility acquires high quality products at reasonable prices, patients will benefit just as they do when high-quality diagnostic tests are performed.

Organization of Hospital Delivery System

Hospitals strive to replace declining inpatient revenues with income from alternate delivery systems and services. In this effort, materials managers can play increasingly valuable roles in improving the bottom lines of these services. Hospitals' ability to reduce operating costs while maintaining quality of service will be a vital factor in whether or not these alternate services succeed or fail. The development of centralized material distribution centres to support a facility or group of facilities will accelerate. Well trained specialists would operate these centres round the clock which are designed to fulfill the total supply management needs of the organization. A major emphasis is to ensure that clinical people spend their time in direct patient care and that those who are best able to do so in a cost effective way perform non clinical support functions. Performance targets for MM functions should be established for all operating areas of the organization. For example, the value of inventory to be invested in the surgery department, as well as turnover rates and rates of availability, should be determined jointly by the materials manager and surgery manager, monitored, and adjusted as needed. Emphasis should be on how this investment contributes to the primary goal of patient care and to the organization's total bottom line. Active standardization committees play a great role in the hospital's daily operation. These groups have strong administrative support

and are involved in the standardization of products, systems, and actual performance. Such a committee may routinely review inventory turnover by department and serve as added support to the materials manager in correcting performance problems. **Nearly 20 percent of the average cost of materials is related to capital equipment that many times has been acquired without adequate involvement from the purchasing department.** Administrators of effectively managed hospitals demand that a triad approach, involving the requesting department, purchasing department, and biomedical engineering department, be used to manage all major capital acquisitions from start to finish.

IMPACT OF INFORMATION TECHNOLOGY

Computer support is the order of the day, even in smaller hospitals. With the continuing expansion of the microcomputer and personal computer markets, many organizations operate online, in a real-time environment. Materials managers will have to stay abreast of changes in computer support systems if they hope to remain competitive in the healthcare industry of the future. Forecasting models and other techniques, such as **Material Requirements Planning (MRP)**, which have been well established in other industries, can be modified for use in healthcare.

Standardized material requirements will be established for each diagnosis and procedure. As projected admissions and surgery cases are scheduled, the computer systems generate lists of required materials. These are compared to on hand/on order quantities and replenishment orders are generated automatically. Thus, the flow or consumption of materials is tied directly to the actual workflow of the institution. The need to develop these standard material requirements serve as the springboard for improving communication between material managers and clinical managers. This also accelerates understanding of the interrelated nature of everyone's contribution to direct patient care. Every healthcare facility should also adopt standard cost accounting practices. This will be critical in ensuring that patient care is provided at an acceptable level of quality and at a profit. The mark of the effective organizations is their use of an interdisciplinary team approach to developing standards and managing costs. Team members include representatives from finance, clinical departments, medical records, and materials management.

There has been an increasing use of direct computer-to-computer digital communication between healthcare facilities and major vendors. In addition, bar code and **optical character recognition (OCR)** devices are used routinely in streamlining the handling of the materials. This requires an increasingly effective interface between manufacturers and users of medical products. There will now be more demand on vendors to ship goods just in time. This is based upon the Japanese concept of inventory management and has led to significant reduction in inventory carrying costs for healthcare providers. It will provide a great challenge to material managers to ensure that it does not result in increased stock outs. It will be in the best interests of manufacturers, distributors, and users to work together to find effective systems that can satisfy everyone's profit needs while meeting patients' need for quality care at reasonable cost. Another area in which healthcare providers and vendors ought to work more closely is in the provision of value analysis programmes. Value

analysis involves analyzing a function or product in terms of its components, then attempting to identify the most effective method of achieving the functional objective and the most effective product for applying that method. The goal is to find the most value efficient method or product. This concept should be implemented on a broad scale. The materials manager and the product standards committee serve as the facilitators for seeing that this service is provided to the organization. Vendors will play a significant role in its actual provision. Administrators generally demand that materials management performance be monitored routinely and reported using standardized, statistically valid protocols. These will become more standardized throughout the healthcare industry so that administrators will be able to measure the performance of their organizations more easily both against themselves and against their competitors. As a result, managers will be held more accountable for the actual performance. As the healthcare industry becomes more competitive, this will be reflected in the emoluments. Thus, the manager's personal bottom line gets linked directly to the organization's bottom line. Effective managers, who can help improve their company's bottom line, will naturally stand out in a quantifiable way and can receive significant rewards. Managers who are not able to do this will be replaced ultimately. This is how it should function in a healthy, economically viable environment.

Bright Future Ahead

Individual material managers can do much to see that the healthcare industry reaps the full benefits of effective materials management. They can become involved in professional associations such as the **Indian Institute of Materials Management** at the local, regional, and, ultimately, national levels. Within this framework, they can strive to see that the groups achieve the following objectives:

- Increased communication between the different disciplines of Materials Management.
- Increased communication between materials management entities and related organization's departments such as those for surgical nurses and infection control practitioners.
- Development of a unified professional body to represent the interests of all materials management specialties, as in the case of National Association of Hospital Purchasing - Material Management in USA.
- Participation in regular educational programmes designed to meet the specific needs of the members.
- Sharing of performance statistics among members with the aim of increasing the average level of performance within the community.
- Increased recognition for individual members and the group for contributions to cost-effective healthcare in the community.

The next step is to establish a personal development plan. This can be enhanced by soliciting suggestions from a superior, the head of the human resource department of the healthcare facility,

and key people in the professional organization. **Managers should plan specific steps that will lead to measurable improvement in the following three areas:**

1. Knowledge and skill
 - College level courses leading to higher academic attainments and to correct specific deficiencies.
 - Seminars, symposia and workshops.
 - Enriching their knowledge by reading professional journals.
2. Major performance objectives related to their current position.
3. Recognition of the value of their achievements and those of their staff as they relate to an improved bottom line for the organization.

The health care industry is filled with challenges and opportunities. Its future is bright. Materials managers have learnt and grown over the years. In addition, they are in a fortunate position of having expertise in an area that is becoming increasingly vital to the long term success, and even survival, of the healthcare industry. Their success is bounded only by the breadth of their vision and the degree of assertiveness with which they grasp their opportunities.

PROJECTIONS AND TRENDS IN MATERIALS MANAGEMENT

Predicting trends in Materials Management involves the forecasting of trends in society, engineering, business, government, health, education, and life style. A number of separate but interdependent factors affect the lives of material managers and purchasers in the healthcare field. Medicine is one. General economic conditions, social planning, and social relationships are some others. Still another is technology, including architecture, industrial design and engineering and sanitary engineering. There are environmental as well as system changes. Government, and its actions and acts e.g., price controls, the safety and occupational hazards, minimum wages, medicare and medicaid, the transportation, the public health directly affects the hospital purchasing or materials manager's job. Whether the government is spending, and is more liberal with non profit capital improvement or research grants, or whether it is austere, requiring more local and independent financing, the jobs of materials managers are different because of its influence.

There were fewer laws but more regulations in the 1980s, especially in the healthcare field. The 1990s brought a wider range of freedom, more leisure, less social than technological emphasis, and a higher standard of living, despite inflation. The present decade will search for a set of ideals concurrent with less inflation and the attempt to keep employment constant, eliminate socio economic uncertainties, and offer wider latitude for individual, business, and labour growth.

The trend towards improved ecology, conservationism, consumerism, increased freedom and equality between individuals, a search for less materialistic goals, and an increased emphasis on social rather than technological pursuits is likely. The emphasis will be on newer methods of financing healthcare, rising patient costs caused by long term illness, more attempts to save lives by

highly sophisticated services, the hospital as the centre of healthcare technology, prospective reimbursement by third party payers and diagnostic related groups, and price competition. The pendulum is swinging back to conservatism, although not, perhaps, to the conservatism of the 1940s because of the social legislation enacted since then. Economists have noted several trends that they say will continue in the new millennium. Inflation will continue throughout the world. With tariffs and the increasing cost of products from countries such as Japan and West Germany, imports into USA may decrease. There will be an improved stabilization of the dollar overseas, after some liberalizing of the tariff rules. There will be improved productivity in manufacturing and service industries. Some form of cost control will continue, at least for the next few years, particularly in healthcare, the oil industry, and certain manufacturing and processing industries.

Hospital costs will increase. Some sort of national health insurance programme is necessary in every country, involving payroll taxes and modification of the present system of healthcare. A package that covers all the healthcare costs of the average working family may bring about economies in healthcare. As the pressure for more efficiency in the hospital and more cost effective healthcare increases, administrators and materials managers will seek group purchasing agreements and shared services with other hospitals and with institutions such as universities and colleges.

Marketing healthcare services is another trend for the present decade. This is a business oriented programme applied to all hospitals in which hospitals attempt to market their services in their city or town and in outlying areas through extension of their services. This would mean arrangement of physicians' team to visit and lecture in small hospitals and clinics in rural areas more popularly known as referral hospitals; distribution of literature throughout the state describing a hospital's spectrum of services; and other direct and indirect marketing efforts.

An emphasis on social attitudes will characterize the hospital and other service institutions. Hospital administrators are aware of the trend towards patients' rights, although it is not yet clear how they relate to the physician patient relationship, the hospital physician patient relationship, or legal considerations involving these. Bio ethical concepts such as the right to life and the right to die are being discussed. Hospitals will be affected by an added dimension i.e., consumer movement in healthcare. There shall be spectacular increases in enrollments in healthcare educational institutions. In the recent past, there have been significant increases in admissions to nursing schools, but there are still shortages of nurses, some other paramedics and technicians. As part of new educational efforts, there will be new techniques and institutions for adult education, such as online colleges.

Engineering and Technology

There will be innovations in facility design and construction, because of cost constraints, energy problems, problems with capital financing due to high, almost prohibitive, interest rates. In package engineering, disposables will continue and escalate in volume, with new adaptations. Some manufacturers are beginning to offer both reusables and disposables as alternates. Pre-pareds, such as blood plasma administration sets, will increase, as will unit doses

in pharmaceuticals. In sanitation engineering, there will be a major attempt to meet ecological problems of hospitals through improved waste disposal methods. Safety engineering will continue to be important. There will be extensive centralization of information on high speed data processors. The initial cost of computers will continue to decline, and smaller hospitals will tend to switchover to use of computer systems. Computers will continue to be of major interest to the larger hospitals also because their information storage, retrieval, and reporting costs are remarkably low. Computer services that offer application software programmes will interest smaller hospitals. **Medical telemetry, nurtured by space flights engineering, will be extended to the hospital's special care and emergency units.**

There are many developments in biomedical engineering. Hence an outside research laboratory should be used to test and report on new equipment. Testing of an electric wheelchair might be reported by an electrical test centre. Several such private research laboratories in the country offering highly valuable services to hospitals. A major field of endeavour for the hospitals is addiction to alcohol as well as to drugs. This may require utilization of new technology. Improved machinery will be used to handle laundry, shipping and receiving all materials, and their transportation, vertical and horizontal. An example is the electronic cart. Improvements such as automatic loading and unloading devices and automatic lubrication will result in faster functioning and larger capacities.

Government

Government will always continue to influence trends in healthcare. These influences will be of great importance to the Materials Management department, which is one of the few major departments of the hospital that can affect savings, or at least a reduction in costs. It means more and better source selection, more value analysis or value improvement programmes; more interest in shared services and in group or corporative buying; and new trends in dietary and pharmaceutical purchasing e.g., convenience foods and hospitals with no kitchens. The materials or purchasing managers will continue to attempt to obtain the "best" possible purchase with every hospital rupee spent. Pharmaceuticals are expected to experience the greatest developments but with greater restraints. New molecules are generally expensive and purchasing professionals should be involved in their procurement. This will mean more use of generic drugs and formularies in the hospital. There will be an increase in the variety and volume of laboratory procedures, but new tests will be add ons rather than alternatives. There will be increased do-it-yourself test kits for special conditions. The emergency room and ambulatory surgery will expand, requiring specialized personnel and equipment linked to community emergency services, with helicopters, helipads or heliports at hospitals; radio communication ambulances; and a very sophisticated regional or area wide emergency medical service system. Grants are now being made by the government for emergency care improvements. There will be further rapid growth of automatic chemical analyzers in the laboratory. The order of the day will be that tests will be directly linked to computers for rapid transmission - an automated laboratory system for major routine tests.

A competent materials manager will have all procurement functions; will be responsible for the functional flow of all materials to and from all departments, including dietary, central service,

and pharmacy; and supervise laundry, receiving and stores, central communications and dispatch, communications, inventory control, printing, distribution, disposal, and purchasing research and management. He will have expanded responsibilities, more accountability, and become a vital member of the hospital management team. There have been numerous discussions on the subject of the materials manager. In the final analysis, it is his task to bring together divergent capabilities and produce a smoothly functioning human group. Unless the materials manager is a broad gauged manager, the potential benefits from Materials Manager will not be fully realized. His success should be measured not so much by the individual work that he does, but by his ability to work through others.

HEALTHCARE ECONOMICS

The economics of growth will certainly change. The hospital market has shown some definite indications of rising costs. Expenditures for healthcare have increased with the expectations of a population that has become more knowledgeable about its health and that seeks care from a number of sources the private physician's office, the hospital, the clinic, the public health department, the private non profit agency, and the university centre. Hospitals have increased their expenditures at a greater rate than the rest of the healthcare market. Studies have indicated that hospital expenditure as a percentage of total healthcare expenditures increased from 34 percent to 40 percent during the last two decades; rupee expenditures increased phenomenally. The Indian healthcare industry is seen to be growing at a rapid pace and is expected to become a US\$280 billion industry by 2020. The Indian healthcare market was estimated at US\$35 billion in 2007 and is expected to reach over US\$70 billion by 2012 and US\$145 billion by 2017. According to the Investment Commission of India, the healthcare sector has experienced phenomenal growth of 12 percent per annum between 2003 and 2007. Rising income levels and a growing elderly population are all factors that are driving this growth. In addition, changing demographics, disease profiles and the shift from chronic to lifestyle diseases in the country has led to increased spending on healthcare delivery.

India faces a huge need gap in terms of availability of number of hospital beds per 1000 population. With a world average of 3.96 hospital beds per 1000 population, India stands just a little over 0.7 hospital beds per 1000 population.[9] . Moreover, India faces a shortage of doctors, nurses and paramedics that are needed to propel the growing healthcare industry. India is now looking at establishing **academic medical centres (AMCs)** for the delivery of higher quality care with leading examples of **Manipal Group & All India Institute of Medical Sciences (AIIMS)** already in place. As incomes rise and the number of available financing options in terms of health insurance policies increase, consumers become more and more engaged in making informed decisions about their health and are well aware of the costs associated with those decisions. In order to remain competitive, healthcare providers are now not only looking at improving operational efficiency but are also looking at ways of enhancing patient experience overall. India has approximately 600,000 allopathic doctors registered to practice medicine. This number however, is higher than the actual number practising because it includes doctors who have emigrated to other countries as well as doctors

who have expired licenses. India licenses 18,000 new doctors a year. [Healthcare in India Source: <http://en.wikipedia.org/w/index.php?oldid=369970093>.]

As on today, it appears that the hospital industry is less affected by recession than industry as a whole. Use of hospital services has grown steadily. This was also true during the recession of 1975. Hospitals are healthier than ever today. Most of them are enjoying a greater cash flow because of increased utilization of existing facilities; this, in turn, results in increased income.

The use of outpatient facilities is growing even faster than that of the hospital as a whole. This could be as a result of (a) a greater acceptance of outpatient surgery and (b) the fact that unlike physicians' clinics, emergency rooms both for trauma and medical emergencies are now open for longer hours, at nights, and weekends too. The hospital is playing the role of a family doctor in many urban areas. Outpatient services are accessible: they do not require appointments or involve long period in the waiting room as do physicians' clinics. With the increased use of both inpatient and outpatient facilities, expenditures for hospital supplies, equipment, and services are also increasing. **Richard Dudley and Robert Brouwer** pointed out that "the growth in hospital expenditures is the result of inflation to a great extent, as well as the rise in population, increased use of health resources, and improved procedures for the care of patients." They also commented that "more intensive treatment and new and expensive procedures that contribute to the diagnoses of medical problems and care of patients are now available. These advancements undoubtedly resulted in the broadening of healthcare resources, improved care for the public, and increased revenues." Predicting the future of the healthcare industry is possible if one realizes that the variables may be changed and that, to a great extent, the same variables that changed the healthcare industry earlier will also affect it in the years to come. These changes, in turn, will have a dramatic effect on the field of hospital materials management.

During the decade of 1990's, with the advent of a number of corporate hospitals, the expectations of the patient care have undergone a number of changes.

Important among those are the following:

1. Consumer wants continued high standards of healthcare, but at lower costs.
2. The provider is cast as an adversary of comprehensive national healthcare systems.
3. Business and industry will enter into greater decision making on healthcare changes.
4. Programmes to prevent illness and promote health may follow as ways to reduce costs.
5. Majority of the healthcare institutions are in a most disorganized state.

In order to cope with technological advances in healthcare industry, the hospital purchasing and materials management must understand:

1. The need to avoid dehumanization in the hospital.
2. New biomedical research.

3. Increased medical specialization.
4. A more careful monitoring of new medical technology by the state and central governments.
5. Assessments relating to the efficiency of open heart surgery, foetal monitoring, haemodialysis, and noninvasive radiological and ultrasound diagnostic procedures.
6. The influence of health planning and third party reimbursement on the purchase of new machines: these two factors have been deterrents.
7. Weighing the risks of technology against the benefits.
8. Forecasting requirements.
9. Computers to assist in decision making.

Materials managers have to be aware of the following general trends for hospitals in the next decade:

1. Increased acuity of illness, and increased need for tertiary hospitals.
2. An increase in multi hospital group beds.
3. Cost containment.
4. Increased incentives for ambulatory care.
5. Reemphasis on home care, particularly for the increased aging population.
6. Increase in long term care and facilities.
7. Less technical emphasis on prolonging the life of terminally ill patients.
8. New arrangements in healthcare delivery.
9. Shorter lengths of stay (more utilization review).
10. A decline in residency programmes.
11. New developments in hospital programmes for promoting health, health education, screening for targeted illnesses indicative of high morbidity, and industrial medicine (all outreach programmes and available in both investor owned and non profit facilities).

Following economic trends have been predicted:

1. Inflation
2. Malpractice lawsuits
3. Cost containment
4. Constraints such as less cash flow, less money for modernization, a slower rate of increase for technological advances, priority given to revenue producing activities over service activities, and pressures to limit staffing, new jobs, and pay levels.

5. Increased emphasis on regionalization of patient services.
6. Increased insurance coverage.

STRATEGIES FOR OVERCOMING THE PROBLEMS

1. Creation of holding companies.
2. Broadened financial bases, through contracts with industry, and other organizations, not just insurance firms.
3. Development of marketing strategy new revenues from sale of services and from complementary hospital business activities.
4. The use of political pressure to fight adversaries.
5. More participation by hospitals in the regulatory process.
6. Adoption of new organizational strategies namely multi hospital arrangements such as shared services.
7. Gaining more support from philanthropic organizations and individuals from state and central governments.

FUTURE OF HEALTHCARE INDUSTRY

The future holds increased inflation, more use of Information Technology, changing lifestyles, increased governmental control, and continuing financial problems. All these affect the hospital and, therefore, the materials manager. There will be increased litigation for liability against hospitals and doctors. Safety measures in the hospital will be stressed. There will be increased need for the hospital buyer to resort to group purchasing and shared services and to explore new marketing techniques. The materials manager of future will require more technical knowledge of products and equipment that he is asked to purchase. He will need to establish an affinity with the physicians on the staff and with the heads of the various specialized departments in hospital care. The materials manager will need to be better educated, not only in materials management, but in those businesses and clinical areas that are related to his work. More people with master's degrees in healthcare administration are expected to become materials managers. Materials manager needs to take a human relations approach to building up and nurturing relationships, and understand the need to work well with people at all levels. In short, the materials manager of the future should be very well qualified so that he or she can move from the materials management position to that of assistant administrator, associate administrator, or administrator. There are indications that this is already happening in several of the larger hospitals throughout the country. Materials manager needs to see his work in relation to his institution, the community, and the political, social, and economic trends. His goal is to keep pace with advances in procurement techniques and goals; many that have been tested and adopted in manufacturing and service industries are applicable to the healthcare field. If the



administration of healthcare is to provide improved quality care at less cost, under new forms of organization, the purchaser must be in the forefront of these new healthcare developments, both for the benefit of his institution and ultimately for the benefit of the patients.

Medical humanism is beginning to emerge. This humanism is a challenge to the materials manager. Instead of buying products primarily to meet day to day logistical demands, he or she is required to manage the materials function as part of overall healthcare. The materials manager can be part of an emerging cadre of healthcare people who are bringing about a partnership for health.

Thus the future materials manager in a hospital should be at once a doctor, an engineer, a chemist, an economist and an accountant with thorough grounding in costs and its applications. He would be a good diplomat too and above all a sharp and shrewd administrator endowed with quick wit. **His effectiveness often makes the difference between life and death.**

EPILOGUE

The future - The confluence of bio technology and Information Technology is the harbinger of the future. It will make way for neural networks and systems on chips embedded into human skin to transform the capability of managers beyond comprehension; with bated breath, we await the exciting future.

SUMMARY

A dynamic profession like the Materials Management evolves continuously absorbs new ideas, concepts and philosophies. Materials today are the life blood of industry without which no organization can operate. The growing complexity of materials combined with its scarcity and high cost and the increasing volume of production naturally shifted the importance to "materials" as it became the largest element in the total cost of the product.

In India, the concept of materials management was in vogue several centuries back. Modern armies still practice this logistics of material. There are quite a few authors who believe that Materials Management is a logical extension of purchasing function. This has led to recognition of materials management as a specialized managerial function. It allows considerable improvement of materials management staff. Materials management is termed as "**The last Gold Mine**" for business executives. Materials management is basic part of any organization that produces a product or service of economic value. Very soon, materials managers will have a career superior to a vice president. Materials Management will perform a more and more important role in the future.

The complexity of organizations and the use of IT have increased, thus increasing the need for well trained and competent Materials Managers. Industry and commerce will need not only more Materials Managers, but also better prepared and more efficient and agile ones. Well-trained and efficient Material Managers will earn higher salaries and perks because they are important executives. A survey of literature on Materials Management indicates that there are many definitions of Materials Management. Different authors included different functions in Materials Management. However all the authors are unanimous in Materials Management, basic three

functions - purchasing, stores, inventory control (which includes sub functions of planning, handling, and distribution).

Modern industries cannot realize profits, and thus cannot survive, without the use of sophisticated forms of materials management, such as material requirements planning. There has been little understanding of role of purchasing by non-purchasing executives. Today's purchasing manager must be one of the most knowledgeable managers in his company.

MM in 1981 concentrated on the theme of "Materials Management and Corporate Objectives". The theme of 'Curbing Inflation by efficient Materials Management' was the flavor of the day. By 1984, the theme was "Inventory Management for Corporate Results". It clearly came out that corporate results could only be achieved through efficient and effective Materials Management. Materials in the manufacturing sector constitute 50 to 70 percent of the total cost and savings would make the product competitive in the market. From the year 1994 onwards, Materials Management started relying more and more on Information Technology and the relationships among, Information Technology, Materials Management, and corporate competitiveness.

Supply Chain Management encompasses all elements of sourcing, indenting, procuring, production scheduling, order processing, inventory management, transportation, warehousing and customer service as well as the information and monitoring system.

Healthcare provision must be viewed as an industry like any other. At one time, hospital supplies were limited. The single-source control system of inventory management, processing, and distribution of materials became the key to bringing order out of chaos. Material Management qualifies as a system. This system of is one of the elements that tie the total organization together. **The concept of material management must be integrated into the total operating philosophy of a hospital if that facility is to be efficient.**

The levels of education and expertise of hospital materials managers are increasing. Some trends are apparent and can serve as starting points for managers as they design future material management programmes for their facilities. More organizations are establishing corporate level positions, such as vice president, that will have total responsibility for the management of materials throughout the facility. In the past, no attention was devoted to developing Materials Management personnel. Staff level Materials Management jobs often have been regarded as entry level positions, requiring little background. Hospitals strive to replace declining inpatient revenues with income from alternate delivery systems and services. In this effort, materials managers can play increasingly valuable roles in improving the bottom lines of these services. The development of centralized material distribution centres to support a facility or group of facilities will accelerate.

Material managers will have to stay abreast of the changes in computer support systems if they hope to remain competitive in the healthcare industry of the future. Forecasting models and other techniques, such as material requirements planning (MRP), which have been well established in other industries, can be modified for use in healthcare. Standardized material requirements will be established for each diagnosis and procedure. The need to develop these



standard material requirements serve as the springboard for improved communication between material managers and clinical managers. Every healthcare facility should also adopt standard cost accounting practices.

Team members include representatives from finance, clinical departments, medical records, and Materials Management.

- There is increasing use of direct computer-to-computer digital communication between healthcare facilities and major vendors. It will provide a great challenge to material managers to ensure that it does not result in increased stock outs. The materials manager and the product standards committee serve as the facilitators for seeing that this service is provided to the organization. Administrators generally demand that materials management performance be monitored routinely and reported using standardized, statistically valid protocols. Individual material managers can do much to see that the healthcare industry reaps the full benefits of effective material management. Hospital material managers have learnt and grown over the years.

A number of separate but interdependent factors affect the lives of material managers and purchasers in the healthcare field. Government, and its actions and acts e.g. price controls, the safety and occupational hazards, minimum wages, Medicare and Medicaid, the transportation, the public health directly affect the hospital purchasing or material manager's job. In the years to come, there will be improved productivity in manufacturing and service industries. Some form of cost control will continue, at least for the next few years, particularly in healthcare, the oil industry, and certain manufacturing and processing industries.

- **Hospital costs will increase :** As the pressure for more efficiency in the hospital and more cost effective healthcare increases, administrators and material managers will seek group purchasing agreements and shared services with other hospitals and with institutions such as universities and colleges.
- **Marketing healthcare services is another trend for the present decade :** An emphasis on social attitudes will characterize the hospital and other service institutions. Hospitals will be affected by an added dimension a consumer movement in healthcare.
- **Computer services that offer application software programmes will interest smaller hospitals :** Government will always continue to influence trends in healthcare. The material or purchasing managers will continue to attempt to obtain the "best" possible purchase with every hospital rupee spent. A competent materials manager will have all procurement functions; be responsible for the functional flow of all material to and from all departments, including dietary, central service, and pharmacy; and supervise laundry, receiving and stores, central communications and dispatch, communications, inventory control, printing, distribution, disposal, and purchasing research and management. There have been numerous discussions on the subject of the materials manager. Unless the materials manager is a broad-gauged manager, the potential benefits from MM will not be fully realized.

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The future holds increased inflation, more use of Information Technology, changing lifestyles, increased governmental control, and continuing financial problems. All these affect the hospital and, therefore, the materials manager. There will be increased litigation for liability against hospitals and doctors. There will be increased need for the hospital buyer to resort to group purchasing and shared services and to explore new marketing techniques. The materials manager of the future will require more technical knowledge of the products and the equipment that he is asked to purchase. The materials manager will need to be better educated, not only in materials management, but in those businesses and clinical areas that are related to his work. More people with master's degrees in healthcare administration will become material managers. In short, the materials manager of the future should be so well qualified that he or she can move from the material management position to that of assistant administrator, associate administrator, or administrator. This humanism is a challenge to the materials manager. Instead of buying products primarily to meet day-to-day logistical demands, he or she is required to manage the materials function as part of overall healthcare. The materials manager can be part of an emerging cadre of healthcare people who are bringing about a partnership for health.

REVIEW QUESTIONS

1. Describe briefly the evolution of Materials Management function in hospitals.
2. What would be the future of hospitals Materials Management in India?
3. What are the recent trends in Materials Management in India with particular reference to healthcare industry?
4. Write short notes on
 - a) Impact of Information Technology on Materials Management
 - b) Impact of engineering and technology on hospitals Materials Management
 - c) Healthcare economics
 - d) Future of healthcare industry in India
 - e) Origin of Materials Management

