LONG-RANGE PLANNING FOR HOSPITAL FOOD SERVICE LAYOUTS

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LONG-RANGE PLANNING FOR HOSPITAL FOOD SERVICE LAYOUTS

By

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PREFACE

This report is intended for two categories of readers: those who have actively participated in planning hospital food service layouts and who seek supplementary guidelines; those who have never been members of planning committees and who would possibly benefit from an appreciation of programming problems. Frequently individuals of the latter group have been the severest critics of recently designed hospital food services.

The sources of information represent a review of available literature, pertinent graduate courses, correspondence, observations and interviews, and my experience as a hospital dietitian.

In order to gain a basic knowledge of the problems involved in food service layout and design, a drawing was developed for a proposed 300-bed U. S. Army Hospital. The purpose was not to produce a perfected plan, but to provide a reasonable competence to evaluate hospital food service layouts. Ten weeks were required to complete the plan. The many hours contributed by Miss Gladys Knight, Associate Professor, School of Hotel, Restaurant and Institutional Management, Michigan State University, in the direction of the project are sincerely appreciated.

Field trips were then made to three Midwest university medical centers for the purpose of observations and interviews. I am indebted to Miss Ruth Gordon, Director of Nutrition and Dietetics, University of Kansas Medical Center; Doctor Margaret Ohlson, Director of Nutrition, State University of Iowa Medical Center; and Miss Grace Stumpf, Director of Dietetics, University of Michigan Medical Center, for their

contributions to the interviews. The philosophies of management expressed at these institutions provided a broad concept of programming techniques.

Informal observations were made at the recently completed Walson Army Hospital, Fort Dix, New Jersey and Munson Army Hospital, Fort Leavenworth, Kansas.

The writer is grateful to Professor Katherine M. Hart for her guidance and assistance in the completion of the problem; to the Office of the Surgeon General, Department of the Army, for the appointment to the Army graduate program; and to Lieutenant Colonel Katharine E. Manchester, Chief Dietitian, Army Medical Specialist Corps, for her encouragement and assistance.

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INTRODUCTION

Layout and design are an integral part of management in a hospital food service department. All too often top-level management makes little or no provisions for this assignment on a sound, long-range basis. Many hospital food service layouts show the lack of coordinated long-range planning and, consequently fail to relate the kitchen design to functions actually performed. Because increasing costs of construction and equipment warrant an effective planning program that will minimize operational costs and reduce renovation expense, active participation among hospital administrator, dietitian, engineer and architect is necessary. This paper presents elements of long-range planning as applied to the design of hospital food service layouts.

LONG-RANGE PLANNING FOR BUSINESS MANAGEMENT

Decisions that most critically influence the success of a long-range planning program include those involving the selection of an appropriate project, allocation of responsibilities to the right individuals and arrangement of a logical sequence of action.

Planning Concepts

> The function of management planning in an organization it that function which establishes goals for all parts of the company, in terms of results to be accomplished and at the same time allocates physical, human and financial resources throughout the company to attain these goals. Short-range planning deals primarily with the existing activities of the company to capture a larger share of the market on a more profitable basis than its direct competitors; longer-range planning relates to the progress of the firm compared with the general economy and must go beyond forecasts of five or ten years. . . .[1]

This current philosophy of management had its inception in the writings of a late nineteenth century French industrialist, Henri Fayol (1841-1925), who developed principles of management which are considered as basic concepts today (21). He recognized planning as an essential element of the managerial process, which is initially an effort to think through the various steps in goal directed activities to efficiently achieve the designated ends. Although planning, according to Fayol, is manifested in a variety of ways, the plan of action is the chief sign and most effective instrument. The features of a good plan of action are

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[1]Robert E. Brooker, President Whirlpool Corporation. Long-Range Planning. Paper presented at Graduate School of Business Administration Seminar, Michigan State University, February 15, 1961. (reprint)

unity, continuity, flexibility and precision. Preparation of the plan is one of the most difficult and most important concerns of every business and brings into play all departments and all functions, especially the management function.

In 1961, business executives not only recognize planning as essential to managerial functions, but view long-range planning as a new dimension in the economy and as one of the significant business developments of the century. Business and industry are aware of the importance attached to adapting readily to change for survival and are exhibiting an ever-increasing interest in long-range planning which takes into account economic, political and social changes as well as the scientific and technological developments (2). Conceptual skills, as opposed to the technical and human relations skills are now the prime requisite of management.

The dynamic character of the business environment today makes planning difficult. The long-term period is selected on the basis of a period of years in which management has some degree of confidence that predictions bear a permissible degree of validity. War, revolutionary inventions, and drastic economic changes may not be anticipated with any degree of accuracy; these are the calculated risks management assumes in the process of long-range planning (46). The development of a five- or ten-year plan is not an Ivory Tower job for one or two gifted individuals, but a very practical, factual, down-to-earth assignment which makes a team approach absolutely necessary (60).

It is top-management that initially must recognize and accept the importance of accomplishing effective long-range planning, and must allocate responsibilities for the function within the organizational structure. Only men with real management breadth are capable of assigning proper weights to the many considerations involved in charting a future course of action. The specialist with a departmental point of view can make

only a limited contribution to an over-all plan for the company. The key planners should be in the position to recognize all long-term implications and, therefore, have access to confidential information. As a general rule, the staff secures the background information to support top-management and the line functions carry out the plan.

Large organizations, faced with far-reaching decisions in allocation of resources, are turning with increasing frequency to working parties made up of businessmen, lawyers and economists charged with the responsibility for assessing the potential gains and risks of alternate policies, recommending action programs, and planning the strategy and tactics of their execution. The teams are organized as ad hoc groups, assembled for specific assignments and disbanded on completion of their mission (1).

Programming

Koontz and O'Donnel (46) clarified the nature and techniques of planning by outlining the steps involved in thorough and logical programming.

The first step in the planning process is the establishment of objectives. This must be at the level of the entire enterprise, but the necessity for having an objective or objectives for each derivative or subordinate plan also becomes evident. Planning must be for or toward specific goals because the objectives give the key to basic action, where to place the primary emphasis, and what to accomplish by the network of policies, procedures, budgets and programs. The objective of the total enterprise should control the direction of major plans. The entire range of objectives applicable to a department's planning should be understood by all those involved.

A second logical step is the establishment of, agreement upon, and dissemination of, planning premises. These are forecast data of a factual nature and basic policies expected to be applicable for the future. Premises, then, are planning assumptions. They are the future setting against which all planning takes place. Planning premises must be agreed upon by the managers involved; different sets of premises can be costly to a company. A single standard for the future is a necessary step in good planning, even though this standard includes several sets of premises, with the instruction that different sets of plans be developed on each. An example of this situation occurs when a company develops plans in prospect of both war and peace. Planning premises must be communicated to all managers in order to have intelligent and coordinated programming.

A third step in the planning process is to search for and examine alternative courses of action. These alternatives should offer the best possibilities for productive execution. Alternatives that are not immediately apparent may be the best.

The fourth step is to evaluate the alternative courses of action; examine the strong and weak points of each; weigh the various factors entailed. This evaluation is usually very difficult due to uncertainties, problems of capital shortages, and intangible factors. For example, a company may wish to enter a new product line primarily for purposes of prestige. The forecast of expected results may show a clear loss, but the question is still open as to whether the loss, which is believed to be forecast within a narrow margin of error, is worth the gain in prestige.

The fifth planning step is that of selecting the course of courses of action to be undertaken. Often an analysis and evaluation of available alternatives will disclose that two or more courses are advisable and

the manager concerned may decide to do several things rather than the one best thing.

The last step is to construct derivative plans to give effect and support the basic plan. For example, it might be necessary to develop new policies and procedures for effecting the course of action. Plans do not accomplish themselves; they require a breakdown into further plans, with each segment of the company and each manager concerned executing the subsidiary plans necessary for making a basic plan a reality.

PLANNING HOSPITAL FOOD SERVICE LAYOUTS

The concept of a hospital as a charitable institution has disappeared and, in order to keep pace with the times, hospital administration has recognized economic, political and social changes as well as scientific and technological developments. The fundamentals of long-range planning for business management are essential to hospital administration and are readily adaptable to hospital design and layout.

Basic Considerations

In 1947, the Committee of the Food Administration Section of the American Dietetic Association published an excellent procedure for the planning of floor layouts of food service departments (57). Since then, several writers (42, 38) have re-emphasized sections of the report.

There is a definite need for new planning guides for hospital food service layouts based on research data and long-range implications. Scientific planning criteria and practical long-range considerations have been incorporated in very few hospital food service layouts.

Donaldson (19) reported that due to new food products, new equipment, automation and increased operating costs food service departments must evaluate their organization and management procedures through research and developmental programs. In addition, a change in the trend of research is necessary to bring food administration to the level of progress of other major industries.

One food facilities engineer (8) attributed insufficient research by management during preliminary programming to the overlooking of essential details. As a result, renovations are necessary shortly after

the food service department is in operation; alterations made on drawing paper are economical in comparison to the great expense involved in renovating a building constructed of brick, concrete and steel.

Hudenburg (32) cautioned hospital planners that a Grand Tour of relatively new hospitals has many pitfalls. Equipment and design frequently do not relate to the requirements of the proposed hospital and observations may result in the duplication of planning that is at least five years old. In turn, this plan may have been copied from another five year old layout, and so ad infinitum.

In his recommendations for building new hospital food service departments May (52) commented that an important factor to ultimate success in programming is the realization and conviction that design and management are inseparable. In his discussion, the word management refers not only to the chief dietitian, but applies equally to the hospital administrator and to his trustees, who are ultimately responsible for success or failure of hospital departments.

The team approach in the organization for planning hospital food service layouts is recognized as the intelligent starting point. West and Wood (71) recommended that after the building allowance has been approved, the architect, food director, business manager or administrative officer, maintenance engineer, and other qualified persons work together in formulating the detailed plans. The pooled interests, knowledge and experience of this group, with the aid of experts in various fields, lessen the chance of error in the development of plans for an efficient and workable food service. Gottlieb and Couch (27) recommended that the industrial engineer be added to the team of specialists who are responsible for planning successful institutional kitchens.

In order to effectively design the areas in which food is produced and served, the architect is dependent on information obtained from the

dietitian. The architect and the contractor are often blamed for equipment and its location when actually the fault is the failure of hospital authorities to furnish adequate information (61). The work processes should be described to the architect in terms of time, action and dimension of a work and management arrangement, plus a logical justification that the way the work is being done is the best way.

In summary, most writers agree that the best planning team consists of top-management who sets policy, department heads who furnish the details of operation, the architect who envisions design and the construction engineer.

Planning Procedures

The American Dietetic Association (57), the American Hospital Association (30), and qualified individuals (25, 38, 61) have formulated planning principles for hospital food service layouts. While the procedures do not share identical sequence, the basic concepts are the same. The following section directs attention to steps involved in planning, reviews ideas of several kitchen planning consultants and discusses the long-range implications of pertinent research studies that could influence the design of hospital dietary departments.

Define objectives

Simplicity based on function is the essence of modern architectural planning. Simplified building must be preceded by simplified thinking, which depends on an understanding of fundamental requirements. Creative thinking translated into firm, clear objectives is necessary in order to plan a food service operation so that it will be successful from the beginning, as well as in the years to come. The long-term policies, procedures, budgets and programs of the entire enterprise, namely the

hospital, should be reflected in the goals established by the dietary department.

The major objective of food service planning is the selection and arrangement of facilities and equipment for the development of an efficient food service and for the production of excellent food to meet the nutritional needs of both patient and personnel; achievement involves minimum effort, confusion, waste and cost.

Determine operations

After the objectives are defined, decisions must be made as to what activities will be necessary to accomplish the established goals. Basic operations may be classified as follows: menu planning, food purchasing, cost accounting, food preparation, patient and personnel food services, sanitation, dishwashing and diet instruction. Additional activities, such as research and education, would be considerations if the food service was located within a large medical center.

A possible situation of universal concern today, and one which could influence the effectiveness of the hospital as well as food service operations, is survival in the event of nuclear attack. In addition to identifying the required normal operations, the planning team must make provisions for the continuance of essential food service activities in anticipation of such an emergency.

Currently under construction, The Southwest Texas Methodist Hospital is designed to enable hospital personnel and patients, plus a limited number of outsiders, to maintain themselves for 14 days in complete safety even though the entire outside area be destroyed or completely saturated with lethal radiation (50). The first of its kind to be constructed in the United States, this building represents the beginning phase of a master plan for a 750-bed hospital. The initial stage provides 175 beds plus supporting services and spaces for additional facilities

to handle 250 patients. The vital services are housed in two below surface levels. These include x-ray, laboratories, central service, surgical operating room, recovery room, kitchen and dining room, stores, emergency service and areas of storage space equipped with oxygen and suction outlets for use in disaster. Construction is expected to be completed in 1962 and at that time tests will be conducted to determine how efficiently the under-ground survival complex functions.

The food service for this nuclear age hospital will provide an entirely new concept of preparation and service. The hot menu items will be prepared in advance and stored in a frozen state until a short time before meal service. Advance preparation of hot menu items will require only one eight-hour shift of cooks per day. Other apparent advantages of the system include the immediate availability of food in a prepared state and in the exact quantities required. A review of the blueprint of the food service facilities of the Southwest Texas Methodist Hospital shows more than the conventional freezing space and less food preparation equipment than would normally be planned for a hospital of this size. Electronic radar cookers, located in the decentralized ward diet pantries, will provide rapid heat to the foods before the tray is served to patients. Disposable plates and cups will be used, reducing dishwashing to a minimum. Immediately after occupancy, a research program will evaluate this type of patient tray service in order that the techniques may be perfected before the event of actual disaster.

Analyze menu pattern

Menu analysis, although recommended by most kitchen planning consultants, is either ignored or followed in a haphazard manner. The process does take considerable time, and is not always practical. However, the hours contributed to a scientific study of the menu pattern, might be rewarding in the money saved in renovation at a later date.

Dana referred to the menu as a master blueprint that must be followed to achieve major goals of intelligent planning and definitely advised that it be interrelated with the design of the layout (16). Terrell agrees that analysis of the menu pattern, as well as type of service and volume of production, not only definitely indicates the number of pieces and sizes of equipment, but establishes desirable work flow and provides a basis for determination of labor requirements (65).

One of the most complete studies of the menu and its relation to equipment requirements and location was reported by Thomas (67). The study demonstrated that the development of criteria for determining the pieces of equipment needed in an institution kitchen is directly related to the production demands placed upon that equipment. She concluded that plant or kitchen layout can be based on analysis of the processes which must be carried on in the preparation of the various typical food products, and the space and time which each of these requires. By finding the maximum demands placed on each type of equipment at any one time during a period of production, the total equipment needs can be anticipated. A study of the flow of materials through the kitchen will provide information basic to the best arrangement of equipment. Thomas adapted motion and time study techniques formulated by industrial engineers to the analysis of food production.

Gottlieb and Couch applied the cross chart, a tool used by industrial engineers, to the planning of food service layouts (27). The cross chart is a graphic device, somewhat like a road chart, which shows mileage between cities. The trips of production materials are plotted on a graph as to forward, back-tracking and by-passing moves between pieces of equipment or work areas. An analysis of the completed cross chart usually results in a more efficient layout through the re-arrangement of equipment. In food production, as in multi-product manufacture, the problem is one of planning the most efficient layout

for the variety of items to be produced. Processing the ingredients of a diversified menu requires a number of different pieces of equipment; thus a layout arrangement is desirable which will reduce the frequencies and length of trips for greater efficiency in production. In this study 16 recipes from 11 menu categories were tested on the cross chart to obtain valid information on which to base decisions in layout planning. The results indicated that in planning the institutional kitchen layout, the factors of distance and menu item importance might make it desirable to arrange the equipment with particular emphasis on efficiency for certain categories of menu items.

Long-range decisions will be influenced not only by the menu format, but also by the stage of pre-preparation in which the food is procured. This will have a significant effect upon types, sizes, and amounts of equipment purchased, in addition to location in the kitchen area. The trend is the elimination of preparation labor and equipment through the use of foods which require only slight conditioning on the premises. The use of convenience foods results in lower labor costs, less need for skilled labor, standardization of cost and portion control (47).

Freeze-dried products are available in a limited variety and are expensive. The freeze drying process is still in the experimental stage and when perfected will make it possible to hold a variety of perishable foods such as meats, poultry, seafood, fruits and vegetables at room temperature. The acceptance of this new type food by institutional food services in the future could influence freezer and refrigeration requirements.

The effect of frozen factory-prepared menu items on equipment, utensil and layout needs of the institution kitchen was demonstrated in a study conducted by Gottlieb and Bloetjes (26). A comparison was made of the number of pieces of equipment and utensils required, the frequency of use, and the floor space needed for the equipment operated in

the preparation of 16 fresh kitchen prepared menu items and the same menu items purchased frozen factory-prepared. The authors summarized the results:

> 1. The production of the 16 fresh kitchen-prepared menu items required 34 individual pieces used 314 times; while, the finishing of the 16 frozen factory-prepared menu items required 12 individual pieces of equipment used 20 times. This represented a difference of 22 fewer pieces of equipment with a usage of 285 times less for the frozen factory-prepared menu items.
>
> 2. Utensils required for the production of the 16 menu items, fresh kitchen-prepared, were 85 individual pieces with a usage of 343 times; while the finishing of the 16 items, frozen factory-prepared, were only five in number with a total usage of 13 times. This showed a difference of 80 pieces of utensils fewer with a usage 330 times less for the frozen menu items.
>
> 3. The area occupied by the 34 pieces of equipment required for the 16 fresh kitchen-prepared menu items was 718.50 square feet; while the area occupied by the same menu items, frozen factory-prepared, was 287.75 square feet, a difference of 420.75 square feet fewer for the frozen items.
>
> 4. The results of the study may be interpreted as showing that the following savings were offered by the use of 16 frozen factory-prepared menu items over the requirements for the same menu items, fresh kitchen-prepared:
>
> 64.7 percent reduction in number of pieces of equipment
> 94.1 percent reduction in number of pieces of utensils
> 58.6 percent reduction in square footage

A thorough analysis of the menu pattern, as well as the type of foods purchased will result in an efficient and economical food operation. In view of increasing equipment and labor costs, the planning team should devote as much time as possible to relating menu demands to the layout.

Determine areas

The following conventional areas are incorporated into the plans of most hospital food service departments:

1. Receiving and storage
2. Meat processing
3. Vegetable pre-preparation
4. Salad preparation
5. Main cooking
6. Diet cooking
7. Bake shop
8. Cafeteria and dining room
9. Patient tray service
10. Pot and pan washing
11. Dishwashing
12. Garbage storage
13. Employee facilities
14. Offices

The necessity of some areas, or their existence as a separate unit is questioned today. The changing concepts of food procurement, preparation and service enter into the modification or elimination of conventionally accepted areas. When area requirements are under consideration, the steps for the improvement of work methods, as listed by Barnes (9) should be applied: eliminate, combine, change sequence, simplify.

There has been some speculation as to the complete elimination of the kitchen area. In 1960, Dana stated that there will always be kitchens for deep-fat frying, broiling and sauteing, as well as for roasting medium or rare meats. The utilization and availability of more pre-cooked frozen menu items would promote the commissary type of operation. However, in order to justify the elimination of equipment

for bulk feeding, the limitations of frozen cooked foods must be realized, particularly quality and variety (56).

Almost every conventional food service area has been affected by current trends. The following examples represent only a few changing concepts of requirements.

* Storage area, both dry and refrigerated, will be greatly influenced by the types of food purchased for use in the menu.

* The utilization of pre-fabricated and portion cut meats does not require a fully equipped meat processing room, or as much refrigeration for storage of carcass meats.

* Pre-peeled and cut raw vegetables, especially potatoes, are used by more institutions than in the past; this would modify not only space requirements, but also the need for vegetable peelers and cutters.

* More activities are moving into the main preparation area. Examples of this are modified diet preparation and bakery production. Space requirements are reduced, walled partitions are eliminated and equipment duplication is minimized.

* The necessity for refrigerated garbage rooms is decreasing with the increased use of mechanical garbage disposals at points of use.

At this stage of planning, a comprehensive check list of factual data concerning the hospital and the food service departments provides essential information for making decisions regarding areas. See Appendix A.

Establish flow lines

After decisions have been made concerning objectives, operations, menu pattern and areas, the next step is to develop a logical work flow among units. According to Thomas (68), ideally, each food product

would follow a straight, short line from the receiving entrance to the service centers; but since this is physically impossible, a variation of this plan is to route products along different loops into departments adjacent to the main flow line and to direct items behind appropriate service areas. To establish flow lines that relate efficiently to menu format requires considerable time which is justified by reduced labor costs.

The basic flow chart (Figure 1) enables planners to visualize the relationship of the various work units to each other. The work flow is shown to proceed in an orderly manner; the units are identified which require contact with one another, as well as with the rest of the hospital. This chart is essentially the same for all food service establishments. The differences depend on the complexity of the menu, the number of meals served and the type of institution. For example, in a hospital the relationship of the patient tray service to other activities is extremely important. The ward carts should be able to leave and enter the kitchen without crossing major traffic lanes.

The decision of the planning committee to innovate radical concepts of flow lines must be carefully weighed for acceptability by future administrative staff. If a system does not reasonably conform to accepted standards and is introduced as an experiment, flexibility should be included in the design. Consideration of individual differences concerning efficient work flow is important if the proposed layout is to be workable for the life of the food service department.

Determine equipment requirements

The factors affecting the selection of kitchen and serving equipment are budget, available space, type of service, number of people to be fed, length of serving period, type of fuel and labor (71).

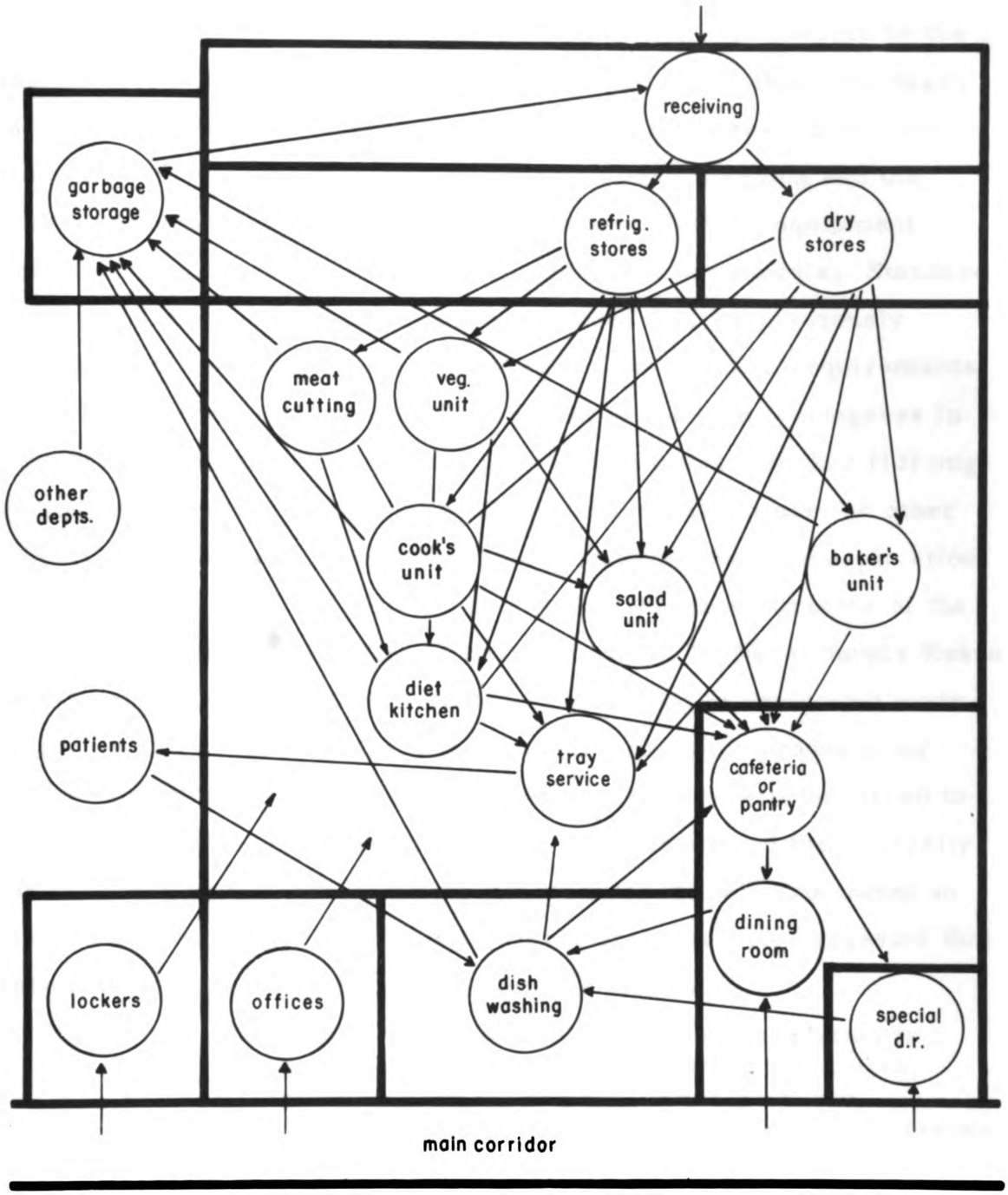

Figure 1. Basic flow chart.

Source: M. W. Northrup, "Planning the Floor Layout for the Food Service Department," Jour. Am. Diet. Assn., XXIII (1947), 36.

Unfortunately, it is not always practical to select and arrange equipment while the plan is on the drawing board. This would be the logical step in view of the fact that space allocations should be based on the dimensions of the equipment occupying that area. Since the time interval between the drawing board stage of planning and the actual occupancy is approximately five years, delayed equipment selection would make it possible to purchase newer models. Standard arrangements of equipment should be avoided for, as previously emphasized, each food service department has specific requirements.

Some writers (41) have been critical of the lack of progress in equipment development within the past twenty years. Blaker (13) suggested investigation of equipment already successfully used in other industries in order to determine if that equipment has any application in food service field. Arthur C. Avery (5), technical director of the Food Science and Engineering Division of the U. S. Naval Supply Research and Development, has been frank in his criticism of equipment manufacturers and suggested that if they do not modernize products for present and future needs, the food service operator will be forced to turn to food technology for the answer. He emphasized the necessity for research by the equipment manufacturers, if the latter intend to make the same progress as comparable industries. He suggested that research and development be channeled as follows:

1. Determine requirements of the food service operation in terms of types of equipment, food production capacities, standard dimensions, speed of preparation required, versatility, temperature ranges, heat distribution and degree of control.

2. Evaluate present equipment for conformity with good human engineering criteria.

3. Determine what additional food, labor and cost saving features can be incorporated into new equipment.

4. Design, build and test new equipment for present and future requirements of quantity feeding.

Although there have been no recent innovations in food service equipment design, manufacturers are producing more items featuring compactness, mobility and multi-function. Because increased building costs have placed premium values on space, the trend is to reduce the number of square feet occupied by equipment. The increased use of vertical space has been suggested (20).

Mobile equipment contributes to the flexibility of the layout. In planning hospital food services of the future, to predict the best arrangement would be impossible, therefore equipment that can be moved to meet new demands would be a wise investment. Adequate space should be provided for storage. Equipment items are appearing on the market in combinations compatable to usage. Examples are steam jacketed kettle with food mixer attached and steamer with frozen food cabinet beneath.

The cantilevered positioning of cafeteria display counters, steam kettles, sinks, steamers, shelves and tables has been installed by some food services. The mounting of kettles on walls permits an unbroken floor surface and improves sanitation. Piping for kettles comes through the wall and is concealed in the mounting bracket, which has a hinged base for access. Drain pipes for sinks are inserted in the wall to maintain an unobstructed floor surface in critical sanitation areas around sinks (45).

The microwave oven has been on the market for about 15 years and until recently was considered primarily a merchandising tool. At the present time several industrial food services utilize these ovens in plant feeding; the standard kitchen in these factories has been practically eliminated. Pre-packaged frozen meals, ordered from a central commissary, are available on the cafeteria line for self-service by the

customer who places the item in the microwave oven. This system with minor variations has been applied to some hospital food services (10, 58). To date, the greatest limitation is inability to handle bulk foods. Typical microwave cooking and reheating times are shown in Tables 1 and 2.

The use of ultrasonic equipment, involving high frequency sound waves for dishwashing, is anticipated for tomorrow's food service operation (24).

Technological changes have gradually been introduced to the food service industry, but, to date, the impact has not been significant. In all probability, the equipment requirements for hospital dietary departments will conform to changing concepts of food preparation and service.

Allocate space

When allocating space considerable thought should be given to the possible expansion of hospital facilities in the future. Supporting departments, such as food service, should allow for this expansion in the original plans. The floor plan must not only be adequate for present activities but allow for the future growth and development of the hospital (25).

The total area to be occupied by the dietary department is based on the size, type and location of the hospital, type of distribution system, building arrangement, number and types of dining rooms and number of personnel. Space requirements vary greatly, in that food service departments, exclusive of dining room space, occupy from 12 to 36 square feet per hospital bed (31).

According to Gordon (25), the amount of space required must be determined by individual hospitals and there is no rule of thumb.

Table 1. Typical Microwave Oven Cooking Times

Quantity	Item	Time
1	Beef, standing rib, 22 lb.	45 min.
1	Beef, boned and rolled, 9 lb.	20 min.
1	Chicken, 3 lb.	9 min.
1	Lobster, 1½ lb.	3½ min.
½	Chicken, prebrowned	2½ min.
1	Club sirloin, preseared, 12 oz.	26 sec.
4	Club sirloin, preseared, 12 oz. each	1 min.
2	Lamb chops, preseared, 5 oz. each	35 sec.
1	London broil, preseared, 2½ lb.	1 min.
1	Chopped sirloin, preseared, 8 oz.	35 sec.
1	Fish fillet, 5 oz.	30 sec.
15	Fish fillets, 5 oz. each	6 min.
1	Baked potato, 6 oz.	2 min.
12	Baked potatoes, 6 oz. each	15 min.
12	Baked apples, 5 oz. each	4 min.
	Link sausage, 1 lb.	4 min.
	Bacon, 1 lb.	4 min.

Source: R. V. Decareau, "The Microwave Oven in Hospital Food Service," Hospital Management, LXXXVII (March, 1959), 96.

Table 2. Typical Microwave Oven Reheating Times

Quantity	Item	Time
1	Roast beef, 6 oz. slice	15 sec.
1	Casserole, 8 oz.	1 min.
1	No. 10 can green beans	6 min.
	Mashed potatoes, 4 lbs.	4 min.
1	Baked potato, 8 oz.	40 sec.
1	Apple pie (six portions)	50 sec.
14	Swedish meat balls, 1 oz. each	1½ min.
	Spaghetti, 1 portion	15 sec.
1	Meat loaf, 4 oz. portion	30 sec.
1	Slice, ready cooked ham, 3 oz.	20 sec.

Source: R. V. Decareau, "The Microwave Oven in Hospital Food Service," Hospital Management, LXXXVII (March, 1959), 97.

West and Wood (71) also stated that the amount of floor space required and how it is divided depends on specific requirements. They strongly advocated that no one formula for allowances meets the needs in all situations. Accurate estimates of dining room areas have been calculated, based on type of service, and seating turnover (16). Kitchen area requirements are not so easily defined and methods based on meals served or other factors are unsound and unreliable.

May (52) and Laschober (49) recommended space allocations for hospitals and commercial institutions, respectively. Both writers presented the figures as guides and not as specific information. However, planners who do not take the time to develop a complete analysis of requirements have been provided convenient criteria for space allocation decisions.

No yardstick has been developed that has satisfactorily measured requirements of a specific hospital food service department. The judgment of individuals who understand the detailed functions should replace rules of thumb. The most qualified member of the planning team for dietary departmental space allocation is the dietitian.

Review completed plan

A review of the decisions recorded in programming should be evaluated before the blueprint becomes a reality. During the planning period any change of hospital policy which could significantly affect the future layout of the food service department should be incorporated, and the previous decision discarded.

REALISTIC VIEW OF PLANNING

Conscientious programming of hospital food service layouts does not always assure continuity of original plans for the life of the structure. The human factors of management are always a threat to original planning concepts. As a rule, logical explanations exist when changes in layout and design occur.

A Renovation Program

Layout and design of new hospital food services are vulnerable to change from the first day of occupancy. This section illustrates the impact of deviation from original planning premises on the layout and design of a recently occupied dietary department.

Introductory information

The dietary department of a Midwest university medical center was selected for observation and interview. The hospital in which this department is located consists of approximately 1000 beds and has a large outpatient service. Scope of patient treatment is broad and parallels that of a comparable general hospital.

The hospital origanizational structure is headed by a board of regents. The immediate administration of the hospital is delegated to a director, an associate director, assistant directors and administrative assistants. The director of dietetics is responsible to one of the assistant directors. In turn, accountable to her, are four individuals who control the major operations of food production, therapeutics and patient tray service, education and research.

The food service activities occupy an estimated 40,000 square feet of space located in the ground, basement and first floor levels of the main hospital building. The present dietary facilities were occupied about three years ago. The approximate total number of meals served per day is 6700 of which 2700 are to ward patients. A peak production of 3300 meals to both patients and personnel is reached at noon. The service centers consist of one cafeteria and 13 decentralized diet kitchens.

The situation

The renovation programming for this dietary department was developed by a representative committee of hospital administrators, dietary staff, architects and engineers. The functions of the dietary department were defined and the layout was developed accordingly.

At the time of occupancy no major discrepancies were encountered, and for all purposes the resulting structure was functional. Six months later, the director of dietetics resigned and a successor was employed. There was almost a complete turnover in staff dietitians during the following two years.

The new director in accordance with her principles of hospital food service and with the approval of hospital administration, gradually introduced operational changes. One of the changes concerned the menu and specifically affected type of menu, types of food purchased and methods of preparation. A brief discussion of each and the consequences follows.

Type of menu. A selective cycle menu replaced a limited non-cycle menu for patients and personnel. Purchase and order procedures were standardized and, consequently, the clerical man hours were reduced.

Type of food purchased. Frozen vegetables replaced almost all canned items previously utilized in food preparation. This increased the demand on freezer storage which had been planned only for immediate needs.

The purchase of pre-peeled potatoes and carrots eliminated the requirement for two large vegetable peelers. At present, only the potatoes for sodium restricted diets are peeled on the premises and this averages 25 pounds per week. The use of dehydrated potatoes not only eliminates the requirement for a vegetable peeler, but reduces the total steamer work load.

The purchase of sectioned oranges and grapefruit has decreased storage requirements.

Method of preparation. A new set of standardized recipes corresponding to the cycle menus was introduced. This altered the production loads of various pieces of equipment. For example, the recipes required increased use of steam jacketed kettles and grills; a decreased use of range-tops, broilers, steamers and ovens resulted.

The introduction of small batch cookery reduced the amount and size of equipment utilized in preparation. Few vegetables are cooked in the steamers; almost all are prepared in small steam jacketed kettles.

The over-all equipment requirements were not only altered, but considerably decreased. With the removal of some equipment, the rearrangement of other, the work flow pattern also changed.

Interpretation

1. The ultimate goals of head dietitians are essentially the same, but the methods of attaining objectives vary among individuals. The differences are caused by the variety of ways people perceive identical objects and situations. Dietitians differ in concepts of workable hospital food service layouts; what is ideal for one presents problems to another.

No one procedure exists. To completely standardize food service operations would destroy initiative and curtail progress. In the case presented, if the director of dietetics who assisted in planning had remained in all probability the layout would have been reasonably functional for her.

2. The long-range plans for hospital food service layouts should incorporate flexibility. This involves the ability to change a plan without undue cost or friction, to detour and to keep moving toward a goal despite new environment or failure of plans. The need arises from the uncertainty of the future and from the fact that many plans require commitment of funds, policy or effort for varying periods in the future. Flexibility in design would enable dietary departments to adapt readily to reasonable changes of policy, procedures and individuals. Examples of this are mobile equipment and a minimum of permanent wall partitions.

3. Even though a representative committee coordinates programming, outside influences and pressures can not always be controlled. At times decisions are forced and do not necessarily reflect the opinion of all committee members. Individual departments within an organization sometimes suffer when the enterprise as a whole is considered.

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APPENDIX

APPENDIX A

Check List of Basic Factual Data

I. PROJECT
- A. New
- B. New Addition
- C. Renovation

II. HOSPITAL
- A. Number of Beds
  1. Present
  2. Future
- B. Patient Category and Number
  1. Medical
  2. Surgical
  3. Tubercular
  4. Children
  5. Orthopedic
  6. Neuropsychiatric
  7. Obstetric
  8. Other
- C. Number of Staff
  1. Present
  2. Future
- D. Administrative Policy Affecting Food Service Activities
  1. Present
  2. Future

III. FOOD SERVICE
- A. Organization Chart
  1. Number of employees
     a. Male
     b. Female

2. Category of employees
    a. Civilian
    b. Military
3. Job descriptions
4. Work schedules

B. Training
1. Dietetic interns
2. Student nurses
3. Employees
4. Facilities required
5. Other

C. Research
1. Type
2. Facilities required

D. Menu
1. Type
    a. Cycle
    b. Non-cycle
    c. Selective
    d. Non-selective
2. Format
    a. Types of foods incorporated
    b. Method of preparation

E. Food Supply
1. Requisition and delivery schedule
2. Issues to preparation areas
3. Number days inventory stored

F. Meal Service
1. Hours
    a. Ward

b. Cafeteria

2. Number fed breakfast, lunch, dinner, midnight
    a. Ward
    b. Cafeteria
3. Patient tray service
    a. Type
        (1) Centralized
            (a) Tray trucks
            (b) Dumbwaiters
            (c) Subveyor or trayveyor
            (d) Airline-type tray cart
        (2) Decentralized
        (3) Centralized-bulk
        (4) Ambulatory patient service
    b. Special equipment requirements
    c. Proximity to hospital elevators
4. Cafeteria service
    a. Seating turnover factor
    b. Modified diet service
    c. Ambulatory orthopedic service
    d. Separate dining areas required
    e. System of meal payment

G. Sanitation
1. Dishwashing
    a. Centralized
    b. Decentralized
    c. Isolation
2. Garbage disposal
3. Trash disposal
4. Drains

H. Utilities

1. Gas
2. Electricity
3. Steam
4. Compressors

Problem

Fisk, Mary Louise