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SPAN OF CONTROL: AN ANALYSIS OF THE INFLUENCING FACTORS

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9 March 1972

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BY

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US ARMY WAR COLLEGE, CARLISLE BARRACKS, PENNSYLVANIA

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A MONOGRAPH

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Determination of the proper span of control is a matter to be considered by every organization. Management theorists from the classical school of thought have traditionally advocated a prescribed limit to the span of control, usually ranging from three to eight subordinates. The current trend, however, is to identify and consider the variable factors which influence a supervisor's span of control and determine the optimum span for each specific management situation. Management experts are beginning to question the validity of a prescribed limit. While there is no all-inclusive listing of the factors which influence span of control, there are certain major factors which have general applicability. Span of attention, knowledge, personality, and energy are the primary factors which impact on a supervisor's personal capacity to manage and control his subordinates. The major external factors which influence span of control include: (1) the level of the organization being considered; (2) the degree to which authority and responsibility have been delegated; (3) the number of personal contacts with subordinates required of the executive; (4) the similarity of the functions being performed; (5) the training and competence of subordinates; and (6) the geographical dispersion of the organization.

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PREFACE

This Monograph was prepared in fulfillment of the requirements of the Shippensburg State College Graduate Program in business and the U.S. Army War College Student Research Program. The subject was selected from a list of acceptable topics provided by the Shippensburg professor, Dr. Richard T. Hise. While the focus of this paper is toward business organizations, the subject was chosen because of the belief that the factors which influence span of control also apply to military organizations. The analysis presented herein is based on a study of selected published literature pertaining to span of control found in the Shippensburg State College Library and the U.S. Army War College Library.

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INTRODUCTION

The purpose of this term paper is to examine the variable factors which influence the number of subordinates a supervisor can effectively control--the span of control. This analysis is based upon a study of selected published literature dealing with span of control. It should be noted that some writers in the field of management choose to refer to this as the span of management since, in their view, the span is one of management as opposed to a span simply of control.[1] For the purpose of this paper span of control and span of management are considered to have the same meaning. As a prelude to the examination of the several influencing factors, a review of the development of the theories regarding span of control is deemed appropriate.

BACKGROUND

The problem of span of control has long been recognized as being critical to the effectiveness of an organization.

Hamilton's Theory

Sir Ian Hamilton, a British general, is generally credited with being the first person to bring public attention to the principle of span of control.[2] Based on the history of military organizations and his own personal experience, he thought that the span of control should be three near the top of the organization and range up to six near the bottom. He based this on the belief that "the average human brain finds its effective scope in handling from three to six other brains."

Regarding the division of responsibility, Hamilton stated that if a man divided his responsibilities among two subordinates, he would not have enough to do; but that if he delegated responsibility to three subordinates, he would be kept fairly busy. He also stated that "the smaller the responsibility of the group member, the larger may be the number of the group and vice versa."[3]

V. A. Graicunas' Theory

V. A. Graicunas, a French management consultant, was one of the earlier writers to recognize the span of control problem. Rather than viewing it simply in terms of a superior dealing directly with a certain number of subordinates, in a study published in 1933, Graicunas theorized that the problem was compounded by the superior's direct relationship with the different groupings of his subordinates, and the cross relationships between all of his subordinates. He divided these relationships into three categories: direct single relationships, direct group relationships, and cross relationships. The number of these relationships vary considerably with the size of the subordinate group. Each subordinate added will create one additional direct single relationship while the group and cross relationships increase much more than proportionately.[4] Following is a simple illustration of this theory.

> If A supervises two persons, B and C, he can deal with them individually or as a pair. The behavior of B in the presence of C and C in the presence of B will differ from their behavior when each is with A alone. Furthermore, what B thinks of C and what C thinks of B constitute two cross relationships which

> A must keep in mind when delegating work on which B and C must collaborate in A's absence. In other words, even in this extremely simple unit of organization, with two subordinates, a superior must keep up to six relationships constantly in mind.
>
> Then, when a third subordinate, D, is added A's direct relationships with individuals increase by only 1 (A-D), but the various groupings he may have to deal with increase by 7 (A-B-D, A-D-B, A-C-D, A-D-C, A-B, C-D, A-C-BD, and A-D-BC), and the various cross relationships he may have to deal with increase by 4 (B-D, D-B, C-D, and D-C), making a total of 18.
>
> A fourth subordinate brings the total up to 44. The situation really gets complex when a fifth subordinate is added--even granting that many of the relationships will never need explicit attention. The superior again increases his direct relationship by 1--representing a 25% gain in his power to delegate. But the number of group and cross relationships he may have to deal with has gone up from 44 to 100--more than a 100% increase in the burden of supervision and coordination.[5]

As evidenced by the illustration above and Table 1, the rapid increase in the number of relationships to the increase in the number of subordinates is startling.

Table 1

Possible Relationships with Variable Number of Subordinates[6]

Number of Subordinates	Number of Relationships
1	1
2	6
3	18
4	44
5	100
6	222
7	490
8	1,080
9	2,376
10	5,210
11	11,374
12	24,708
18	2,359,602

While Graicunas' theory emphasizes the complexities to be faced by a manager, it's important to note that he does not address the frequency or severity of the relationships among the subordinates.[7] Although he does acknowledge that "this factor will operate with much less force where the work done by each of the various subordinates does not come into contact with that done by others."[8] Graicunas made no specific recommendation as to the number of subordinates that should be controlled by a superior. However, Lyndall F. Urwick did reduce Graicunas' theory to a statement of principle a few years later, to wit: "No superior can supervise directly the work of more than five, or at the most, six subordinates whose work interlocks."[9]

Classical School of Thought

The classical theorists normally agree that the span of control should be limited to five or six.[10] Some writers cite figures varying from three to eight.[11] As an example, Ernest Dale states that "no superior should have more than six immediate subordinates whose work is interrelated."[12] This agrees with Urwick's position that a superior should have "no more than six subordinates whose work interlocks."[13]

The classical school subscribes to this limitation on the number of subordinates based on a recognition of the limitation of human factors.[14] The tendency appears to have been to simply specify the limits of the span of control without due consideration of the underlying factors which might influence the ability of an executive to control his subordinates. This emphasis on limiting the span of control was in all probability adopted from the military thinking on this subject.[15]

While the military must depend upon tight control and strict lines of authority, especially under battlefield conditions, necessitating a very limited span of control, it does not follow that this same logic would apply to other situations.

In fact the current trend by management theorists is to be critical of the classical theory, since many surveys of successful businesses have shown that the span in actual practice is often much wider than that advocated by theory.[16] It remains an accepted fact that the number of subordinates a supervisor can control is limited. However, rather than accept the theory that the number is fixed, the trend is to the position that there are too many variables which impact on span of control to arbitrarily prescribe a limit.

Span of Control and Organizational Structure

Incident to a discussion of span of control is the need to consider its impact on the organizational hierarchy since they are inseparable. If an organization has broad spans of control, it will have fewer supervisory levels and be flat in structure. If the same organization has narrow spans of control with many supervisory levels, it will be tall in structure.[17] Aside from the economic considerations, there are two primary factors cited in favor of a flat structure:

1. The flat structure complicates supervision and forces delegation of responsibility, causing subordinates to exercise initiative and to function independently. This in turn facilitates the training of these subordinates and enhances their development for future executive positions.

2. The flat structure, having fewer hierarchical levels, reduces the administrative distance between the top and bottom, thereby facilitating communication up and down the organizational structure. This serves to reduce the omissions and misinterpretations as information is passed from superior to subordinate and vice versa. This vertical communication advantage is offset to some degree, however, by a reduction in the channels for lateral communication.[18]

Some organizations are apparently abandoning the theoretical rules which prescribe a fixed span of control. Evidence of this is a survey conducted by the American Management Association in 1951 of 141 companies, 100 companies with over 5,000 employees and 41 smaller companies. As indicated in Table 2, of the 100 big companies more than 50% had nine or more men reporting directly to the president. Only 20 presidents had less than seven subordinates under their direct supervision. In the 41 smaller companies, 25 presidents had a span of seven or more. The median span for all 141 companies was between eight and nine, a number which according to some writers is about right for lower level supervisors but not for top management.[19]

Table 2

Number of Executives Reporting to President in 100 Large Companies[20]

Number Reporting to President	Number of Companies
1	6
2	0
3	1
4	3
5	7
6	9
7	11
8	8
9	8
10	6
11	7
12	10
13	8
14	4
15	1
16	5
17	0
18	1
19	0
20	1
21	1
22	0
23	2
24	1

Ernest Dale, the AMA researcher on this survey, attributes communication difficulties to being at least part of the explanation for this gap between theory and practice. He states that top executives are trying to improve communications down the line by talking and dealing directly with a lot more people. Dale goes on to say that this gap is also explained by the fact that a lot of companies are cutting out some of their middle managers, giving line officers more authority, and placing them directly under the president.[21]

There are two good examples of this. After the war, Sears, Roebuck and Co. reorganized and decentralized control for almost everything except purchasing. This was done to give key executives more subordinates than they could supervise closely, thus forcing the subordinates to assume more of the responsibility themselves. That reorganization placed Sears' 13 regional vice-presidents, each with full authority for everything in their territory (except purchasing), under the direct supervision of the president.[22]

The second example is International Business Machines Corporation which eliminated one complete level of middle management. The duties of this group were assigned to the plant managers and foremen, thus increasing the span of control for higher management.[23]

This change in thinking could be the result of natural growth or business expansion. However, some companies, instead of filling spaces on their organizational chart as they expand, are leaving these spaces vacant and giving broader authority further down the line. The result is the elimination of long chains of command (tall structure) and placement of more subordinates directly under top management.[24]

Of course there must be a limit to the span of control, but to prescribe the ideal size of the span is an oversimplification which could lead to undesirable and confusing conclusions. Thus, to determine the appropriate span of control in any given management, it is necessary to consider a number of pertinent factors.[25]

FACTORS INFLUENCING SPAN OF CONTROL

Although empirical research to determine the factors which influence span of control has been relatively limited, many experts in the field of management have studied this problem in considerable detail. Their findings indicate a wide spectrum of factors which might influence the size of the span. These factors can be divided into two categories: those influencing the personal capacities of the executive, and those factors external to the executive. Factors normally cited as being indigeneous to the executive include span of attention, knowledge, and personality and energy; other factors in the following discussion fall into the second category.

Span of Attention

The span of attention refers to the "number of things a brain can heed at any one time, plus the length of time it can concentrate on any one thing."[26] As discussed earlier in this paper, Hamilton recognized this limitation in his early writings. He believed that the human brain could effectively deal with only from three to six other brains.[27] Graicunas cited this limitation as the basis for his theory on relationships.[28] In supporting Graicunas' theory, Urwick states that based on the psychological concept of a limited span of attention, "it seems doubtful if an individual can keep track of and understand the large number of group relations involved with more than five subordinates."[29] Although not strictly related to the problems faced by a business executive, psychological literature does support the theory

of a limited span of attention.[30] It should follow, therefore, that the span of control would in fact be limited by the span of attention, theoretically to five or six subordinates. In reality, however, as evidenced by the practices of several large companies, this is not always the case.[31]

Knowledge of the Supervisor

Luther Gulick stated that "the limit of control is partly a matter of the limit of knowledge."[32] It is generally agreed that no executive can be totally knowledgeable in all facets of an organization. However, it is expected that executives possess a reasonably high degree of knowledge for the manager who is capable and well trained can supervise more people. Likewise, if his subordinates are knowledgeable, he can delegate more responsibility to them.[33] Obviously, both of these factors would tend to expand the span of control.

Some managers, it is contended, create departments and appoint subordinate managers to hide the fact that they, themselves, are not technically qualified. Such a situation, it is argued, results in an increased number of subordinates and increases the management problems. In this regard, Koontz and O'Donnell point out that "the job of the manager is to get things done through people, and, to the extent that he does this, he need not be expert in all phases of the business."[34]

Personality and Energy

An executive's personality and energy have an influence on his ability to manage subordinates. The effect of physical and mental

energy should be quite clear. Some individuals seem to have an endless amount of energy while others tire quickly and easily. The manager with the greatest amount of energy to apply to his job should be able to control more subordinates than one with less energy. Koontz and O'Donnell consider the span of energy to be a refinement of the span of time, stating that "energy limits are basically time limits."[35] Gulick has also stated that the limits of time and energy limit the span of control.[36]

Perhaps not so obvious as the effect of a manager's energy on span of control is the influence of his personality in dealing with and controlling people. One writer states the impact of personality as follows: "An 'empire builder' may significantly enlarge his span over a period of time. A submissive individual's span may become smaller as others gradually take over his domain."[37] Koontz and O'Donnell, on the other hand, believe that "a wide span of personality may be a very real factor in executive success, but to regard it as a basic determinant of departmentation is to confuse executive qualities with factors of more general application."[38]

A study made of the store managers of Sears, Roebuck and Co. is cited as an example of the influence of personality. Sears follows the basic philosophy that the span of control should be wide and encourages the maximum delegation of authority. It was noted by top management that some store managers were not adhering to this policy and had created a number of intermediate supervisors, resulting in a narrow span of control, while other managers were in fact delegating authority to the

lowest level. To rectify this situation, Sears systematically transferred the managers who practiced maximum delegation (W managers) to stores where a narrow span of control had been established. Managers who had established intermediate supervisors (N managers) were transferred to stores where a wide span of control was practiced. This was done with the hope that the N managers would make no changes and the W managers would eliminate the intermediate supervisors. Things did not turn out that way, however. The W managers did eliminate the intermediate supervisors as expected but the N managers reorganized their new stores and created the same narrow span of control they had before. This reluctance by the N managers to delegate authority was attributed to their personality.[39]

Level of the Organization

Since the problem was first recognized, management experts have acknowledged that the span of control narrows as you progress up the scalar chain. Many writers believe that top management should supervise no more than three or four subordinates, based on the complexity of the problems and the increased responsibility faced by the top executive. Conversely, the span can be wider at the lower levels of an organization because responsibility is reduced, the work is less complicated, and any decisions made will have less impact on the total organization.[40]

Gerald G. Fisch divides the management hierarchy into four basic groups in discussing the various levels of management. These are the

super managers, general managers, middle managers, and supervisors. He considers super managers to be those at the top of the largest corporations and states that they can probably control up to 50 subordinates. He bases this on his contention that the super manager is not involved in direct personal leadership or the interlocking human relations problems of his subordinates. Instead, Fisch says, the super manager makes one basic, broad decision leaving all other considerations to his experienced and well-trained principal subordinates, in whom he has full confidence, thus permitting an extremely wide span of control.[41]

General managers include the top management level in medium to small-size companies and managers of sub-units in large corporations. In this group Fisch considers personal leadership to be essential. Teaching of subordinates is important and personal contact is a key factor. He states that the span of control is limited at this level by the "personality of the top man, the personalities and capabilities of his subordinates, and certain practical business realities like the complexity of the product line, the number of key locations and the like."[42]

Middle managers are usually less autonomous than general managers and are involved in coordinating a large variety of specialized services and staff groups. According to Fisch, this group "has the unique characteristic of being under extensive direction, while at the same time being surrounded (in most instances) by a series of parallel (or support) groups which can, depending on the circumstances, diffuse the basic line of authority by doing some of the work demanded." The conditions which

influence span of control in this situation are then totally different from that of the super and general manager.[43]

First-line supervisors present an entirely different situation. They deal with people at the very bottom of the hierarchy who normally perform very specialized and carefully prescribed functions. Further, the supervisor at this level probably has limited influence over many of the matters which affect his subordinates. Additionally, the supervisors own work is less complex. Thus the factors influencing the span of control at this level are again unique.[44]

Delegation of Authority

"Decisions should be made at the lowest competent level; that is, responsibility and commensurate authority should be delegated as far down in the organization as possible," according to Ernest Dale.[45] This is almost universally accepted in theory, but yet it is not always practiced. The manager who does delegate authority and responsibility to his subordinates frees himself of involvement in lower level administrative and supervisory tasks. By so doing he reduces the severity and frequency of time-consuming relationships, thus enabling him to expand his span of control.[46]

There are several related points to be considered in this regard. As discussed earlier, the personality of the individual executive could be such that he is hesitant to relinquish any authority preferring to retain maximum control himself. Such a problem would have to be overcome. Further, the training, knowledge and competence of the subordinates to handle added responsibility must be considered.[47] It is also possible

that functions might be so diverse and complicated that one executive cannot exercise adequate supervision, thus forcing him to delegate additional responsibility to his key subordinates.[48] The level of impact of any decisions made must also be considered. As an example, responsibility should not be delegated to a sub-unit manager for matters, such as policy, which would have organization-wide impact.[49]

While the delegation of authority should desirably result in an executive having more time available, there is a possibility that the opposite could occur. If the delegated responsibility is unclear, if the subordinate lacks the capability to handle the added responsibility, or if it's a task he simply cannot do, an even greater amount of the executive's time would have to be devoted to supervising the subordinate.[50]

Number of Superior-Subordinate Relationships

As already alluded to, an executive's span of control is influenced by the number of personal contacts, or face-to-face relationships, necessary in the performance of his duties. Graicunas' study, discussed in detail earlier in this paper, is generally recognized as the best evidence of how the number of relationships increase as the number of immediate subordinates is increased.[51] This theory recognizes that management involves both individual and social problems and that the manager must deal not only with individuals but with different combinations of individuals.[52] The time-consuming aspect of personal contact, combined with the span of attention factor discussed previously, limits a manager's capability in this regard. Thus, his span of control is

limited. Conversely, through better training, clear policy, delegation of responsibility, better planning and control systems and the application of good management practices in general, the number of personal relationships required can be reduced and the span of control expanded.[53]

It must be noted, however, that in many cases personal contact is necessary and desirable. Meetings are frequently necessary to discuss problems or to counsel subordinates requiring assistance. There are undoubtedly numerous other situations which would call for personal contact. Not to be lost sight of is the fact that personal contact is perhaps the best way to get a "feel" for the problems of the subordinate.[54] In discussing this, Peter F. Drucker has said that what he terms "span of managerial responsibility" is determined by the "extent to which assistance and teaching are needed" to help subordinates reach the objectives of their own jobs. He goes on to say that while this is a real limit, it is not fixed.[55]

Similarity of Functions

The nature of the activities of an organization and the similarity of subordinates jobs can have a significant impact on span of control. Gulick stated that:

> Where the work is routine, repetitive, measurable and homogeneous character, one man can perhaps direct several score workers. . . . Where the work is diversified, qualitative, . . . one man can supervise only a few.

Gulick also points out that the effect of these factors is most evident at the top of any organization.[56]

Urwick has emphasized repeatedly that span of control is limited by subordinates "whose work interlocks." If there is no overlap of work or responsibility among the subordinates, the need for intermediate supervisors is reduced. As an example of this Urwick cites Sears, Roebuck and Co where, by the organization chart, 100 buyers report to one manager. This manager has four assistants. So in reality there are five people who supervise the buyers, making the span of control nearer 20 than 100, as implied by the organization chart. These buyers are each responsible for a specific unit of goods; their responsibilities do not overlap. In such a case, assuming the buyers have been properly selected and trained, the supervisor has only to insure that standards are adhered to. The wide span of control poses no particular problem.[57] Conversely, where functions are diverse, top management cannot be expected to be competent in all areas and must assign intermediate supervisors responsibility for the details of the various functions. This reduces the span of control for top management but serves to widen the span for the intermediate supervisor.[58]

Subordinate Training

Well-trained subordinates permit a wider span of control. This is due primarily to the reduced number of relationships necessary between a well-trained subordinate and his superior, plus the fact that a qualified and motivated subordinate can be assigned added responsibilities.[59]

Training of subordinates requires time, energy, attention and knowledge on the part of the superior. At the lower levels of an organization, where the work is more specialized and repetitive, training

is less complicated and time consuming than the effort required at higher levels where an increased degree of diversification is present. This contributes to the capability of the lower level supervisor to manage a greater number of subordinates than a top level supervisor.[60]

The necessity for training is continuous and is linked to the rate of change. Changes in technology, management policies, the environment in which work is performed, and other changes, can all precipitate the need for training. Where the rate of change is slow, this need is frequently overlooked, especially in old established industries such as railroads or banking, as opposed to the more dynamic industries. Admittedly, however, the need for training is less in industries where the rate of change is low, since slow change by itself facilitates subordinate development.[61]

Geographic Dispersion

In his early writings, Gulick cites location of the workers as one of the factors influencing span of control. He stated that:

> An organization located in one building can be supervised through more immediate subordinates than the same organization if scattered in several cities. When scattered there is not only the need for more supervision, and therefore more supervisory personnel, but also for a fewer number of contacts with the chief executive because of the increased difficulty faced by the chief executive in learning sufficient details about a far-flung organization to do an intelligent job.[62]

A condition so basic as the layout of a building could have an impact on span of control. The size or location of the rooms might simply dictate the size and placement of a sub-unit of the organization requiring a separate supervisor. In such a case, the number of

subordinates would not be based on span of control considerations at all.[63]

While it is still a consideration, the impact of dispersion seems to have been reduced by modern technology in transportation and communications. The ability to transmit messages without delay and the speed with which an executive can travel are both influencing factors. Likewise, computers and automatic data processing have facilitated the monitoring and centralized control of widely separated operations. However, the need for an executive to be present to handle important matters and to make spot decisions cannot be overlooked. As with the other factors, the influence of geographic dispersion is variable, requiring independent evaluation of each situation to determine the true impact.[64]

Lockheed's Approach[65]

Desirably there would be a clear-cut formula for determining the optimum span of control which would weigh the impact of all the influencing factors in any management situation. Unfortunately, there is no such formula.

However, the Lockheed Missiles and Space Company (a division of Lockheed Aircraft Corporation) has done some work in evaluating the relative impact of selected factors considered applicable to Lockheed. From this, they developed a procedure to assist them in determining proper spans of control, or as they term it, spans of management. The employment of this procedure, plus good judgment in its application, has helped to widen spans within Lockheed.

After extensive study, Lockheed's organizational analysts identified the following seven factors as having the most influence in determining the span of management at Lockheed:

1. Similarity of function: the degree to which functions performed by the various components are alike or different.
2. Geographic contiguity: the physical location of the components and personnel reporting to a principal.
3. Complexity of functions: the nature of the duties being performed by the organization components or personnel.
4. Direction and control: the nature of the personnel reporting directly to a principal. Includes the degree of the principal's attention which they require for proper supervision of their actions.
5. Coordination: the extent to which the principal must exert time and effort in keeping actions properly correlated and in keeping his activity keyed in with other activities of the company.
6. Planning: the importance, complexity, and time required to review and establish future programs and objectives.
7. Organizational assistance: the help received by the principal from direct-line assistants, staff activities, and assistants-to. (In the case of first-line supervision, lead men would be included.)[66]

These seven factors were then evaluated to determine those most critical. Based on this evaluation and subsequent testing against actual cases, point values reflecting the degree of supervisory burden were assigned to six of the factors. The range of point values assigned are shown in Table 3. Although not included herein, specific criteria were established to determine the point value to be assigned to each factor. The seventh factor, organizational assistance, was treated differently. Since organizational assistance lightens the supervisory burden, it was felt that a supervisor with an assistant could handle a broader span of management. Accordingly, percentage values were assigned to the various types of assistants, which were then used as multiplier factors to reduce the total point value for a given position.

Table 3

Span Factor Point Value[67]

Span Factor	Degree of Supervisory Burden				
Similarity of functions	Identical 1	Essentially alike 2	Similar 3	Inherently different 4	Fundamentally distinct 5
Geographic Contiguity	All together 1	All in one Building 2	Separate Buildings one plant location 3	Separate Locations one geographic area 4	Dispersed Geographic areas 5
Complexity of Functions	Simple repetitive 2	Routine 4	Some complexity 6	Complex varied 8	Highly complex varied 10
Direction and Control	Minimum supervision and training 3	Limited super-vision 6	Moderate periodic super-vision 9	Frequent continuing super-vision 12	Constant close super-vision 15
Coordination	Minimum relation-ship with others 2	Relation-ships limited to defined courses 4	Moderate relationships easily controlled 6	Considerable close relation-ship 8	Extensive mutual non-recurring relationships 10
Planning	Minimum scope and complexity 2	Limited scope and complexity 4	Moderate scope and complexity 6	Considerable effort required only by broad policies 8	Extensive effort required, areas and policies not charted 10

A supervisory index to "suggested spans" was then established based on these point values. The higher the point value, the greater the supervisory burden and the lower the suggested span. For middle managers the scale is as indicated in Table 4. For first-line supervisors, the suggested span is approximately twice that indicated for middle managers.

Table 4

Suggested Standard Span[68]

Supervisory Index	Suggested Standard Span
40-42	4-5
37-39	4-6
34-36	4-7
31-33	5-8
28-30	6-9
25-27	7-10
22-24	8-11

Lockheed has only put this program to limited use; but in each case span of management was broadened, reducing the number of personnel required. Lockheed considers this procedure to be only a guide and emphasizes the judgment which was called for in selecting the critical factors, and which is essential in the evaluation of these factors, in order to arrive at the suggested span. While it has limitations, this plan represents an attempt to bring more objectivity to the spans of management and highlights the factors which Lockheed considers critical in determining that span.

SUMMARY

Determination of how many subordinates a superior can effectively manage is a matter to be reckoned with by every organization. Because of its impact on organizational effectiveness, the span of control problem has been the subject of considerably study in an effort to determine the optimum span.

Management theorists from the classical school of thought have traditionally advocated a prescribed limit to the span of control. This limit, usually identified as ranging from three to eight subordinates, is based primarily on a consideration of the limitation in personal capacities, as opposed to the underlying factors.

Considering the fact that span of control in actual practice varies significantly from the theoretical limit, some management experts are now beginning to question the validity of a prescribed limit. The current trend is to identify and consider the variable factors which influence a supervisor's span of control in order to determine the optimum span in each specific management situation.

While there is no all-inclusive listing of the factors which influence span of control, many writers on the subject seem to agree on certain factors which have general applicability. These fall into two categories, those indigeneous to and those exogenous to the executive. Span of attention, knowledge, personality and energy are the factors most often cited as impacting on a superior's personal capacity to manage and control his subordinates. The major factors external to the

executive or manager which have a significant impact on the span of control include:

1. The level of the organization being considered.
2. The degree to which authority and responsibility are delegated.
3. The number of personal contacts and relationships with subordinates required of the executive.
4. The similarity of functions or work being performed.
5. The training and competence of subordinates.
6. The geographical dispersion of the organization.

CONCLUSION

While there is a limit to the span of control, it is not a fixed limit. Each managerial position is subject to the influence of a combination of several variable factors. These include, but are not limited to, span of attention, knowledge, personality and energy, level of the organization, delegation of authority, number of superior-subordinate relationships, similarity of functions, subordinate training, and geographical dispersion. The optimum span of control can be determined only after a detailed analysis of the management situation and an evaluation of the impact of these influencing factors on specific managerial positions.

FOOTNOTES

1. Henry H. Albers, Principles of Management (1969), p. 102.
Harold Koontz and C. O'Donnell, Principles of Management (1968), p. 241.
D. Voich and D. A. Wren, Jr., Principles of Management (1968), p. 211.

2. Ernest Dale, Management: Theory and Practice (1954), p. 190.
Lyndall F. Urwick, "The Manager's Span of Control," Management: A Book of Readings (1964), ed. by Harold Koontz and C. O'Donnell, p. 152.

3. Sir Ian Hamilton, The Soul and Body of an Army (1921), p. 229.

4. V. A. Graicunas, "Relationship in Organization," Papers on the Science of Administration (1969), ed. by Luther Gulick and Lyndall Urwick, pp. 183-187.

5. Urwick, "The Managers Span of Control," p. 153.

6. Koontz and O'Donnell, p. 246.

7. Ibid., p. 247.

8. Graicunas, pp. 186-187.

9. Urwick, "The Manager's Span of Control," p. 154.

10. Joseph L. Massie, "Management Theory," Handbook of Organizations (1965), ed. by J. G. March, p. 398.

11. Koontz and O'Donnell, p. 244.

12. Dale, p. 190.

13. Urwick, "The Manager's Span of Control," p. 158.

14. Koontz and O'Donnell, p. 244.
Massie, pp. 398-399.

15. Massie, p. 399.

16. Dale, p. 198.
Massie, p. 399.
Waino W. Suojanen, "Leadership, Authority, and the Span of Control," Advanced Management (September, 1957), pp. 17-22.

17. Albers, p. 112.
Joseph A. Litterer, The Analysis of Organizations (1965), p. 308.

18. Albers, pp. 112-113.
Koontz and O'Donnell, p. 244.
Voich and Wren, p. 217.

19. "Management and Business Break Rule on Span of Control," Business Week (18 August 1961), pp. 102-103.

20. Ibid., pp. 102-103.

21. Ibid., p. 102.

22. Ibid., pp. 102-103.

23. Ibid., p. 103.

24. Ibid., p. 103.

25. Koontz and O'Donnell, p. 244.
Litterer, p. 314.

26. Koontz and O'Donnell, p. 251.

27. Hamilton, p. 229.

28. Graicunas, p. 183.

29. Urwick, "The Managers Span of Control," p. 153.

30. R. S. Woodward and H. Schlosberg, Experimental Psychology (1954), pp. 90-105.

31. "Management and Business Break Rule on Span of Control," p. 102-103.

32. Luther Gulick, "Notes on the Theory of Organization," Papers on the Science of Administration (1969), ed. by Luther Gulick and Lyndall Urwick, p. 7.

33. Voich and Wren, p. 212.

34. Koontz and O'Donnell, p. 252.

35. Ibid., p. 252.

36. Gulick, p. 7.

37. Albers, p. 109.

38. Koontz and O'Donnell, p. 252.

39. Voich and Wren, p. 212.

40. Gulick, p. 7.
Hamilton, p. 229.
Litterer, pp. 308-309.
Massie, p. 398.
Voich and Wren, pp. 211-212.
Lyndall F. Urwick, "The Span of Control--Some Facts About the Fables," Advanced Management (November 1956), p. 8.

41. Gerald G. Fisch, "Stretching the Span of Management," Harvard Business Review (September-October 1963), p. 75.

42. Ibid., p. 76.

43. Ibid., p. 78.

44. Ibid., p. 78.

45. Dale, p. 189.

46. Koontz and O'Donnell, p. 248.

47. Voich and Wren, p. 212.

48. Lynall F. Urwick, "Organization as a Technical Problem," Papers on the Science of Administration (1969), p. 57.

49. Dale, p. 568.

50. Koontz and O'Donnell, p. 248.

51. Albers, p. 110.
Urwick, "The Manager's Span of Control," p. 152.
Urwick, "Organization as a Technical Problem," p. 52.

52. Albers, p. 111.

53. Koontz and O'Donnell, p. 250.

54. Ibid., p. 250.

55. Peter F. Drucker, The Practice of Management (1954), p. 139.

56. Gulick, p. 7.

57. Urwick, "The Manager's Span of Control," p. 158.

58. Fisch, p. 80.

59. Koontz and O'Donnell, p. 248.

60. Ibid., p. 248.

61. Ibid., pp. 248-249.

62. Gulick, pp. 8-9.

63. Fisch, p. 80.

64. Albers, p. 112.
Fisch, p. 78.

65. Harold Stieglitz, "Optimizing Span of Control," Management: A Book of Readings (1964), ed. by Harold Koontz and C. O'Donnell, pp. 164-169.

66. Ibid., p. 165.

67. Ibid., p. 167.

68. Ibid., p. 166.

BIBLIOGRAPHY

A. Books

1. Albers, Henry H. Principles of Management. 3d ed. New York: John Wiley & Sons, Inc., 1969.

2. Dale, Ernest. Management: Theory and Practice. 2d ed. New York: McGraw-Hill Book Co., 1969.

3. Drucker, Peter F. The Practice of Management. New York: Harper & Bros., 1954.

4. Graicunas, V. A. "Relationship in Organization," Papers on the Science of Administration. 2d ed., eds. L. Gulick and L. Urwick. New York: Augustus M. Kelley - Publishers, 1969.

5. Gulick, Luther. "Notes on the Theory of Organization," Papers on the Science of Administration. 2d ed., eds. L. Gulick and L. Urwick. New York: Augustus M. Kelley - Publishers, 1969.

6. Hamilton, Sir Ian. The Soul and Body of an Army. New York: George H. Doran Co., 1921.

7. Koontz, H. and C. O'Donnell. Principles of Management. 4th ed. New York: McGraw-Hill Book Co., 1968.

8. Litterer, Joseph A. The Analysis of Organizations. New York: John Wiley & Sons, Inc., 1965.

9. Massie, Joseph L. "Management Theory," Handbook of Organizations. Ed. J. G. March. Chicago: Rand McNally & Co., 1965.

10. Stieglitz, Harold. "Optimizing Span of Control," Management: A Book of Readings. Ed. H. Koontz and C. O'Donnell. New York: McGraw-Hill Book Co., 1964.

11. Urwick, Lyndall F. "The Manager's Span of Control," Management: A Book of Readings. Eds. H. Koontz and C. O'Donnell. New York: McGraw-Hill Book Co., 1964.

12. _____. "Organization as a Technical Problem," Papers on the Science of Administration. 2d ed., eds. L. Gulick and L. Urwick. New York: Augustus M. Kelley - Publishers, 1969.

13. Voich, D., Jr., and D. A. Wren. Principles of Management. New York: The Ronald Press Co., 1968.

14. Woodward, R. S. and H. Schlosberg. Experimental Psychology. New York: Holt, Rinehart and Winston, 1954.

B. Periodicals

15. Entwisle, D. R. and J. Walton. "Observations on the Span of Control," Administrative Science Quarterly, Vol. 5, No. 4 (March, 1961), 522-533.

16. Fisch, Gerald G. "Stretching the Span of Management," Harvard Business Review, Vol. 41, No. 5 (September-October, 1963), 74-85.

17. Udell, Von G. "An Empirical Test of Hypotheses Relating to Span of Control," Administrative Science Quarterly, Vol. 12, No. 3 (December, 1967), 421-439.

18. "Management and Business Break Rule on Span of Control," Business Week, August 18, 1961, pp. 102-104.

19. Simon, Herbert A. "The Span of Control: A Reply," Advanced Management, Vol. 22, No. 4 (March, 1957), 14.

20. Suojanen, Waino W. "Leadership, Authority, and the Span of Control," Advanced Management, Vol. 22, No. 9 (September, 1957), 17-21.

21. Urwick, Lyndall F. "The Span of Control--Some Facts About the Fables," Advanced Management, Vol. 21, No. 11 (November, 1956), 5-15.