

TASKS AND RESPONSIBILITIES OF A FIRST-LINE SUPERVISOR IN A JOB
SHOP MANUFACTURING ENVIRONMENT IN NORTHWEST WISCONSIN

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ABSTRACT

The problem of this study was to identify the tasks and responsibilities of first-line supervisors in a job-shop manufacturing environment in the Northwest Wisconsin portion of the United States. The purpose of this study was to provide insight to the knowledge, skills, and abilities required of the first-line supervisors in a manufacturing environment. An understanding of these attributes would aid in the future selection of supervisory candidates, and it would assist corporate executives in the training and evaluation of personnel in supervisory positions.

The methodology of this research study used a modified Delphi study process, in that it went from the literature review to the development of the tasks and responsibilities from the review of the prior research. The study was executed in four sequential phases, which at its conclusion provided a list of tasks and responsibilities. The first phase was a thorough literature review of work that had already been completed regarding managerial and supervisory tasks and responsibilities. The second phase was the pilot study and the enlistment of the panel members. The third phase was the actual Delphi process using the assembled panel, using the Internet and email to communicate. The fourth phase was the analysis and reporting of the results of the Delphi panel.

The result was a list of 49 tasks. The panel estimated the time spent during their work week on each task, which accounted for 94.2% of their time. Using a Pareto concept of looking at the top 20% or top 10 items for guidance, seven of the top 10 are related to interpersonal communication and skills. These tasks only consumed 21% of

their time, but constituted seven of the top 10 most important tasks as viewed by the panel.

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Chapter 1

INTRODUCTION

First-line supervisors, sometimes called first-line managers, are the first level in the organization's management hierarchy. They are responsible for managing the work of the employees. There are many publications defining supervisory tasks and responsibilities, usually presented in a how-to format, none which cite any empirical research having been done to support their definitions of supervisory tasks (Belker & Topchik, 2005; Bittel & Newstrom, 1990; Boyd, 1984; Eckles, Carmichael & Sarchet, 1974; Phillips, 1985; Ricks, Ginn & Daughtrey, 1995; Robbins & Decenzo, 2004; Sartain & Baker, 1965; Steinmetz & Todd, 1992; Thurley & Wirdenius, 1973). There is a significant amount of research exploring managers and what they do from job processes, function, and roles (Carroll & Gillen, 1987; Fayol, 1949; Fells, 2000; Hales, 1986; Hill, 2003; Lamond, 2003; Mintzberg, 1975; Sayles, 1964; Stewart, 1988). There are formal research studies relating to the tasks and responsibilities of supervision (Allan, 1981; Guest, 1956; Hales, 2005; Kraut, Pedigo, McKenna & Dunnette, 1989; Luthans & Lockwood, 1984; Macdonald, 1982; McCall & Segrist, 1980), but not specifically oriented to a first-line supervisor in a manufacturing environment. In nearly all cases, these sources, whether they are oriented to the first-line supervisor or the first-line manager, or managers in general, are generalized studies of the tasks and responsibilities

inherent in those positions, or at best, do not distinguish the tasks and responsibilities of a first-line supervisor in a manufacturing environment. Additionally, the demands of the market place are dynamic and are majorly impacted by technology. What was required of a supervisor 10 years ago might not be what is required of a supervisor today (Drucker, 1999; Hales, 2005; Kotter, 1996; Moody & Morley, 1999; Robbins & Decenzo, 2004). Considering the lack of current research done to date on this subject, there was an opportunity for research oriented to the tasks and responsibilities of a first-line supervisor or first-line manager (Barber & Tietje, 2004; Delbridge & Lowe, 1997; Hales, 1986; Hill, 2003; Mintzberg, 2004; Sayles, 1989; Whitley, 1989), and thus by extension to a more specific environment, to the production floor.

Statement of the Problem

The problem of this study was to identify the tasks and responsibilities of first-line supervisors in a job-shop manufacturing environment in the Northwest Wisconsin portion of the United States.

Statement of the Purpose

The purpose of this study was to provide insight into the knowledge, skills, and abilities required of first-line supervisors in a manufacturing environment. An understanding of these attributes would aid in the future selection of supervisory candidates, and it would assist corporate executives in the training and evaluation of personnel in supervisory positions.

Statement of the Need

It is essential for the creation, selection, and training of personnel in supervisory positions that the tasks and responsibilities be clearly known (Brannick & Levine, 2002;

Mathis & Jackson, 2003; Rehabilitation Act of 1973, 2006; Title VII of the Civil Rights Act of 1964, 2006; Uniform Guidelines on Employee Selection Procedures, 1978). The need to adequately train first-line supervisors is fairly well known (American Association of Community Colleges, 2006; Brannick & Levine, 2002; DeSimone, Werner, & Harris, 2002; Finch & Crunkilton, 1984; Hill, 2003; Kraut, Pedigo, McKenna, & Dunnette, 1989; Macdonald, 1982; McCall & Segrist, 1980; Mintzberg, 1980; O'Banion, 1997; Twigg, 1992; Workforce Strategy Center, 2002; Whitley, 1989). In order to train supervisors, it is necessary to know what the tasks and responsibilities are of first-line supervision in a job shop manufacturing environment. "All job-oriented training must consider the job itself, that is, the tasks contained in the job or common to several jobs" (Brannick & Levine, 2002, p. 253). It is evident that a job's tasks and responsibilities are needed in developing job descriptions and performance reviews, not only because it is good management but because of anti-discrimination statutes and court decisions (Americans with Disabilities Act of 1990, 2006; Brannick & Levine, 2002; Hales, 2005; Job-Analysis.Net work, n.d.; Macdonald, 1982; Mathis & Jackson, 2003; Rehabilitation Act of 1973, 2006; Title VII of the Civil Rights Act of 1964, 2006; Uniform Guidelines on Employee Selection Procedures, 1978). It is not unusual for the management to have a need to understand what is happening at the supervisory level, thus justifying a formal job analysis (Brannick & Levine, 2002). The need for research in the tasks and responsibilities of a first-line supervisor, especially as it applies to specific industries, has many marketplace origins.

Statement of the Methodology

This research study used a modified Delphi study process, in that it goes from the literature review to the development of a list of tasks and responsibilities derived from the review of prior research. This was the initial instrument for the pilot study. The study was executed in four sequential phases, which at its conclusion provided a list of tasks and responsibilities of a first-line supervisor in a job shop manufacturing environment in Northwestern Wisconsin. The first phase was a thorough literature review of work that had already been completed regarding managerial and supervisory tasks and responsibilities. The second phase was the pilot study and the enlistment of the panel members. The pilot study evaluated the initial list of tasks developed from the prior research discussed in the literature review. The pilot study participants determined that the format of the instrument to be used was clear and insured that they were able to follow the instrument's instructions. The Delphi panel was composed of subject matter experts (SME's), who through the Delphi process reached a consensus. This produced a mean rating on the importance of each task statement. The selection of the panel members or SMEs was critical to the success of the study. The third phase was the actual Delphi process using the assembled panel, using the Internet and email to communicate. The fourth phase was the analysis and reporting of the results of the Delphi panel. Research showed that acceptable consensus is usually achieved by the third round, and this was the case in this study. Each of the participants who completed the study was given the final results of the process. All of the participating companies were given the final results of the study. The results of the panel were analyzed and incorporated into the final recommendations.

Statement of the Assumptions

In order to complete this study, the following assumptions were made:

Panel Members

For the purpose of this study, it was assumed: 1) that the panel members were working first-line supervisors with five years experience in a manufacturing environment; 2) that the panel members were aware, could analyze, and could express in the instrument and to the other panel members what the tasks and responsibilities are of a first-line supervisor; 3) that the panel members willingly participated in this study and did so with altruistic purposes; and 4) that the panel members did not try to espouse a hidden agenda.

Panel Selection

It was assumed that the expert selection process provided experts for the Delphi panel. It was further assumed, due to the method of panel member selection, that the panel was fairly representative of first-line supervisors in a manufacturing environment in Northwest Wisconsin.

Delphi Process

It was assumed that the terms in the questionnaire were understood and familiar to each panel member so that the tasks and responsibilities had the same essential meaning to each member. It was further assumed that there was no impact to the final results of the study as to whether the questionnaires were electronic or on paper.

Statement of Limitations

The study was limited by the following constraints:

Demographic

The demographic limitations were: 1) that the panelists for this study came from job shop manufacturing firms which were clients of the Northwest Wisconsin Manufacturing Outreach Center; 2) that the panelists for this study came from job shop manufacturing firms in the northwest portion of Wisconsin; 3) that the results from this study may not apply to process or batch manufacturing firms; 4) that the results from this study may not apply to firms located out of the northwestern portion of Wisconsin; 5) that the tasks and responsibilities were those identified by the panel during the study period; and 6) that the results from this study may be time sensitive.

Panelists

The panelists were current first-line supervisors with more than five years experience in manufacturing job shops in Northwest Wisconsin. The results from this study might not reflect the tasks and responsibilities of inexperienced supervisors of less than five years. The results of this study might not reflect management personnel with the job title of supervisor, but who have supervisory individuals reporting to them such as lead workers or team leaders. Those individuals were not considered first-line supervisors for the purposes of this study.

Statement of Terminology

Definition of Consensus

Consensus amongst the Delphi panel members for the purpose of this survey was the point where three conditions of agreement were met. Firstly, it included when the panelists agreed that all tasks being rated were relevant in the task list, and that no new task was added to the list. Secondly, it was when the change in rating for each task, on a

scale from 0 to 4, from round to round, changed less than 10% (.10). Thirdly, it was when the average total change, from round to round, for all tasks together was less than 5% (.05). Consensus for the purpose of this survey was the point where the Delphi survey rounds ceased, with the result being the data sought in the study. The range from .01 to .10, often referred to as the level of significance, was chosen because it is often used in testing as meaningful to reaching a conclusion (Glass & Hopkins, 1996; Lane, 2002; McClave & Benson, 1988; Minium, Clarke & Coladarci, 1999).

Definition of Delphi Technique

The Delphi Technique is a methodology to gather and refine the opinions of a group of people, usually a group of recognized experts, in order to synthesize their opinions into a consensus on the subject studied. It does not require face-to-face participation, and because it is anonymous, it is valuable in gaining consensus from a group that might interact negatively, or create a politically or emotionally charged environment. It is especially useful where the panel participants are unable to meet together due to geographical or time constraints.

Definition of First-Line Supervisor

The generally accepted definition of a supervisor in an industrial environment is to supervise workers (Delbridge & Lowe, 1997; Dunkerley, 1975; Hales, 2005; Hill, 2003; Kelly, 1993; Kerr et al., 1986; Lisoski, 2005; Lowe, 1993; Macdonald, 1982; Robbins & Decenzo, 2004; Rose, Newby & Vogler, 1987; Senker, 1995; Steinmetz & Todd, 1992; Walker et al., 1956). The study will use this definition of a supervisor.

Definition of Interpersonal Tasks

Tasks that are oriented towards communicating with superiors, subordinates and peers. Some of these tasks include but are not limited to: motivating subordinates; verbalizing the mission and vision of the organization; providing leadership rather than managing subordinates; keeping superiors, subordinates and peers informed; using verbal and non-verbal communication techniques; resolving conflict; providing praise and verbal discipline; working with customers; and giving advice.

Definition of Northwest Wisconsin

In this study, the area identified as Northwest Wisconsin encompassed any area in the state of Wisconsin north of Interstate 90 where it splits off from Interstate 39/90/94; and west of the Interstate 39/U.S. Highway 53 as it splits off from Interstate 39/90/94.

Definition of Tasks and Responsibilities

The understanding of what exactly is a task was important to this study. It is appropriate to discuss exactly what is meant by a task, and to a lesser extent responsibilities, which flow from tasks. If the nature of the task demands action, then there is a requirement to perform that action as part of the definition of the task. This creates need to perform that task, thus creating responsibilities. This study used Gael's (1983) definition of task in its investigation and research.

A discrete organized unit of work, with a definite beginning and end, performed by an individual to accomplish the goals of a job. A task is described by a statement that starts with an action verb and includes the object of that verb. Tasks performed by job incumbents can be divided into finer and finer segments. As a general rule, tasks should be stated at a

level and in a form suitable to meet the job analysis objectives at hand. Greater degrees of task specificity and detail are usually reserved for specialized technical purposes -for example, preparing training materials or maintenance manuals. Some examples of tasks are to solder leaks in a radiator, to schedule basic input for a manual data *system*, and to operate a paper tape punch and reader. (p. 9)

This study focused on the tasks or the desired outcomes of supervisors exclusively. It was not observational, but specifically elicited from supervisors what they know to be their tasks, or in the words of Hales 'desired outcomes' of their work activity. Gael's (1983) definition of a task will be used in this study.

Definition of the Similar Titles for First-Line Supervisor

In this study, when confronted with a researcher that used the terms first-line supervisor, first-line manager or just supervisor, it was treated as if they are multiple titles for the same function, unless the original researcher specifically and directly made a discernable distinction. For the purpose of this study, the title team leader was not synonymous with supervisor.

Summary

First-line supervisors are the first level in the organization's management hierarchy and they are responsible for managing the work of the employees. It is essential that the characteristics of the supervisory job, defined by its tasks and responsibilities, be known. This is important in order to properly and adequately establish organizational supervisory positions, select personnel for those positions, and train personnel in those supervisory positions. It is also important from a human resources perspective to use the

supervisors' tasks and responsibilities in developing job descriptions and performance reviews, because of anti-discrimination statutes and court decisions, and because it is good management practice. The need to research the tasks and responsibilities of a first-line supervisor has many marketplace origins.

The purpose of this study was to provide insight to the knowledge, skills, and abilities required of the first-line supervisors in a manufacturing environment. An understanding of these attributes would aid in the future selection of supervisory candidates, and it would assist corporate executives in the training and evaluation of personnel in supervisory positions.

Chapter 1 contains the problem, purpose and need of this study; and the assumptions, definitions and limitations of this study. A review of the literature impacting this study is found in chapter 2. The methodology used to conduct this study is contained in chapter 3, and chapter 4 contains the data obtained in the research for this study. Chapter 5 of this study provides a summary of the research, discussion of the conclusions to be drawn from the research results, and provides recommendations for further research and study.

Chapter 2

REVIEW OF LITERATURE

Introduction

In researching the subject of this study, examples of resources examined includes peer reviewed articles, books, journals, magazines, federal code books, doctoral dissertations, and discussions via email with important researchers in this area of study. The major subject areas examined were management, training, job analysis and the Delphi process. Although much was found that supported the subject area, only one study was close to the problem and purpose of this study. That study had enough major differences to conclude that this is a unique study, and not a follow on study to any other research that is readily available through this literature review.

The purpose of this chapter was to identify and summarize the literature and research that pertains to the tasks and responsibilities of a first-line supervisor in a manufacturing environment. This chapter was divided into four major sections: definitions and roles of a first-line supervisor according to literature; definitions of what are tasks and responsibilities; apparent lack of empirical research and how that observation was reached; and prior studies that presented different levels of job descriptions for supervisors, but did not present the tasks and responsibilities of a first-

line supervisor in a manufacturing environment, as perceived by the supervisors themselves.

Definition and Role of a First-Line Supervisor

Statutory Definition

The U. S. Government's definition of a supervisor is contained in section 152, subsection 11, of the National Labor Relations Act, to wit: "The term "supervisor" means any individual having authority, in the interest of the employer, to hire, transfer, suspend, lay off, recall, promote, discharge, assign, reward, or discipline other employees, or responsibly to direct them, or to adjust their grievances, or effectively to recommend such action, if in connection with the foregoing the exercise of such authority is not of a merely routine or clerical nature, but requires the use of independent judgment" (NLRA, 1935). This definition was carried throughout federal, state and local government services.

The National Labor Relations Board (NLRB) in their most current decision regarding this issue, in 2006, reaffirmed this definition, and also reaffirmed that: "The Board has not adopted a strict numerical definition of substantiality and has found supervisory status where the individuals have served in a supervisor role for at least 10-15% of their total work time" (Oakwood Healthcare v. unions et al., 2006). This statutory definition of a supervisor held if only one of the twelve functions are engaged, required independent judgment and either exercised that authority directly or effectively recommended the same. This statutory definition served as the backdrop for many of the human resource and organizational decisions made in the United States.

Industrial Definitions

First-line supervisor or first-line managers. In literature, researchers used the term first-line supervisor and first-line managers interchangeably (Delbridge & Lowe, 1997; Dunkerley, 1975; Hill, 2003; Kelly, 1993; Kerr, Hill, & Broedling, 1986; Lisoski, 2005; Lowe, 1993; Macdonald, 1982; Robbins & Decenzo, 2004; Senker, 1995; Steinmetz & Todd, 1992; Walker, Guest, & Turner, 1956). Hill (2003) in her writings defined the first level of supervision as first-line managers. She identified their primary responsibility as supervision of others, but wrote that the line between first-line supervisor and individual contributor was blurry, for both were expected to do technical work. Macdonald (1982) in his research used the term supervisor generically, rather than first-line manager. He applied that term to someone directly in charge of a work group of two or more workers, regardless of their job title or function. Steinmetz and Todd (1992) also used the term supervisor generically, specifically as the first level of management, but they went farther in calling a supervisor responsible for the first-line management of individual workers. Kelly (1993) defined the person responsible for the supervision of the workers on the shop floor as supervisors. Steinmetz and Todd (1992) defined first-line management as consisting of the “supervisors responsible for the work of individual employees and groups in performing the vital tasks of an organization” (p. 7).

Hales (2005) researched this question of titles. He asked the question as to who are first-line managers.

The term ‘first-line manager’ is conventionally taken to denote those positions representing the first level of management to whom *non-managerial* employees report. Within this broad definition, however, there

is controversy about whether ‘first-line managers’ and ‘supervisors’ are co-extensive or distinct. Often the terms are used interchangeably, as in empirical studies that compare the roles of ‘senior’, ‘middle’ and ‘junior/first-line managers/supervisors’ and, by implication, in studies that define *middle* managers as occupying all those positions between ‘top strategic managers’ and ‘first-level supervisors’. Some journalistic accounts or textbook discussions treat ‘first-line manager’, ‘shop floor manager’, ‘team leader’ and ‘supervisor’ as alternative job titles and some recent analyses have argued that ‘modern’ supervisors should now be considered first-line managers. (Hales, 2005, p. 473)

Hales (2005) concluded with the observation that while some have tried to distinguish between the role of a supervisor and a first-line manager, the efforts have been so piecemeal and compromised that in practice there is little to no distinction.

Definition of the position supervisor. The generally accepted definition of a supervisor in an industrial environment is to supervise workers (Delbridge & Lowe, 1997; Dunkerley, 1975; Hales, 2005; Hill, 2003; Kelly, 1993; Kerr et al., 1986; Lisoski, 2005; Lowe, 1993; Macdonald, 1982; Robbins & Decenzo, 2004; Rose, Newby & Vogler, 1987; Senker, 1995; Steinmetz & Todd, 1992; Walker et al., 1956). This defined the position by the role, supervision. Hill (2003) wrote that the primary responsibility of the supervisor was to supervise others, and it was that formal authority over others that distinguish the supervisor. She found that supervisors, when asked their role, consistently replied: “it meant being responsible and accountable, having power, and being in control” (p. 17). Hill observed that new supervisors defined their position by their responsibilities

and not their relationships. They did not “appreciate the distinction between being primarily responsible for people rather than the task” (p. 21). Hales (2005) observed that the principle responsibility of supervisors was immediate direction and control of an area of work and day-to-day supervision of those who carry it out.

Role, activities and functions of a supervisor. Some of the roles that Hill (2003) found in a supervisor were leader, organizer, liaison, supervisor, administrator and politician. “Accomplishing the job required equal amounts of ‘expertise [technical knowledge], analytical ability, and interpersonal and group dynamic skills.’ The latter were critical; only by effective network building could the new managers implement their agendas” (p. 22).

Macdonald (1982) wrote that the supervisor’s role was ill-defined and ambiguous at times. He stated that the role of a supervisor was to: “plan and control work; motivate subordinates; solve problems and make decisions; provide feedback, coaching, counseling to all members of their work groups; communicate information up, down, and across organizational lines; develop subordinates and self; manage time; and act as knowledgeable representatives of the firm” (p. 4). Hales (2005) found from his research concerning first-line managers (FLM) that:

The core areas of accountability, attaching to the FLM role in over four-fifths of organizations, were quality, efficiency, output, discipline and paperwork. Responsibility for monitoring and reporting performance therefore reflected accountability for performance outcomes. FLMs in most organizations were also accountable for other performance metrics relating to health and safety, expenditure, training needs, absences,

equipment and materials, although this was usually jointly with a more senior manager or specialist department. (p. 492)

Steinmetz and Todd (1992) described supervisors as the first-line of management responsible for planning, organizing, directing, and controlling the workers under them. These functions are directly out of Fayol's (1949) writings, even to the translated titles, except directing has been substituted for commanding. Steinmetz and Todd (1992) also observed that supervision was more than just control, discipline and supervision, but also included establishing relations comprising trust, confidence and mutual respect. There appears to be general consensus on the roles, activities and functions of a supervisor, but not specific enough consensus to create a task list from these writings.

Definition of Tasks and Responsibilities

Theoretical Concept of Task

The Oxford English Dictionary defined task as "Any piece of work that has to be done; something that one has to do (usually involving labour or difficulty)" (Simpson et al., 2008). Mathis and Jackson (2003) noted that a task was a work activity that was distinct and identifiable, where as many related tasks comprised a duty. The distinction between a task and a duty was not always clear. Brannick and Levin (2002) defined a task as an activity that achieves a specific job objective. They also noted that a collection of tasks directed at the goals of a job was called a duty. Gael (1983) stated that a task was an amount of work to be done, oftentimes with a time limitation associated with it. Other researchers wrote that task identification was focused on the behaviors performed in doing a job (DeSimone, Werner, & Harris, 2002; Wexley & Latham, 2002). Noe (2005) defined task as what the worker's activities were in a specific job. Gatewood, Feild, and

Barrick (2008) defined task as specific actions associated with the major activities of a job, which they then called work behavior. They further defined a task by the statement describing the task, which began with an action verb, then described what was done by the worker and for whom or what it was done for, followed by why and how the worker did the action.

Gael (1983) wrote that there was a hierarchy of terms which were commonly found in literature. The highest level was the job, which was a combination of functions performed by workers. The next lower was a function, which was a subdivision of a job and encompassed a work related grouping of tasks. He then defined task itself as:

A discrete organized unit of work, with a definite beginning and end, performed by an individual to accomplish the goals of a job. A task is described by a statement that starts with an action verb and includes the object of that verb. Tasks performed by job incumbents can be divided into finer and finer segments. As a general rule, tasks should be stated at a level and in a form suitable to meet the job analysis objectives at hand. Greater degrees of task specificity and detail are usually reserved for specialized technical purposes -for example, preparing training materials or maintenance manuals. Some examples of tasks are to solder leaks in a radiator, to schedule basic input for a manual data *system*, and to operate a paper tape punch and reader. (p. 9)

This study uses Gael's definition of task.

Many researchers have stated what the roles or activities of a manager should be, but have not stated those roles or activities at the supervisor's level, and not to the level

of a task. Fayol (1949) defined five functions of management: planning, organizing, commanding, coordinating and controlling. Fayol's manager roles were recognized by other researchers (Fells, 2000; Lamond, 2003). Sayles (1964) described the manager's job in terms of activities. He wrote that the majority of a manager's time or activities was as a participant in external work flows, and subdivided this effort into: work-flow, trading, service, advisory, auditing, stabilization, and innovation relationships. The other two activities he identified were the manager as a leader and the manager as a monitor. Mintzberg (1975) identified the managerial roles, made up of three groups: interpersonal roles (figurehead, leader and liaison); informational roles (monitor, disseminator and spokesman); and decisional roles (entrepreneur, disturbance handler, resource allocator and negotiator).

Practical Concept of Supervisor Tasks

Carroll and Gillen (1987) stated that:

A distinction between goals and tasks, with the latter serving as means to the former, should be made in managerial work studies. Managers pursue their own goals and the tasks necessary to achieve them. They are also carrying out the tasks of both the organization and others to further other goal agendas. Thus, managers have what might be called work agendas that included both a goal agenda and a task agenda. (p. 46)

Hales (1986) wrote of the manager's agenda, which was the manager's mental picture of the tasks needed to perform the work required of that manager. Whitley (1989) stated that defining managerial tasks was not as easy as say a task analysis of a machinist. He noted that:

At least five major characteristics of managerial tasks which differentiate them from other sorts of work can be readily identified: (1) they are highly interdependent, contextual and systemic; (2) they are relatively unstandardized; (3) they are changeable and developing; (4) they combine both the maintenance of administrative structures and their change; and lastly, (5) they rarely generate visible and separate outputs which can be directly connected to individual inputs. (p. 212)

Hales (1986) noted that there was a difference between observable activities which involve job performance and the tasks, implied or observed, which were representative of the expected or intended outcomes. He stated:

There would seem to be a distinction between what managers, by observation or report, 'do' – their behavior and activities – and what managers are charged, or seek, to 'achieve' – their tasks, responsibilities and functions. There is, therefore, a distinction between managerial 'work' as a set of *actual behaviours* and as a set of *desired* (either by managers or others) *outcomes*. (p. 105)

Hales (1986) stated that there was reluctance on the part of researchers to distinguish between behavior and outcomes. He observed that:

It is probably more satisfactory to conceive of a *continuum* ranging from simple 'behavior' stripped of context and intention and, therefore, of meaning, through 'activities' or complexes of behavior endowed with context – and/or intention – based meaning, to 'tasks', or the defined goals of activity and finally, 'functions', the intended contribution of managerial

tasks to the organization as a whole. (p. 106)

Lack of Empirical Research

Hill (2003) wrote that “Although countless articles and books offer counsel on how to develop managerial talent, few have been based on empirical research” (p. 6). Hill stated that literature and even formal job descriptions often tell us what management was but fails to provide guidance as to how the incumbent was to perform the function of manager, which can partially be alleviated by knowing what they do exactly. “Of the countless articles and books on developing managerial talent, few are based on empirical research, and even fewer look at the phenomenon from the new managers’ perspective” (p. 260). Mintzberg (2004) wrote that “research on the practice of managing itself remains rare” (p. 36). Hales (1986) stated that:

Researchers have abandoned the search – implicit in some early studies – for the definitive characteristics of *the* managerial job and have been concerned rather to indicate the diversity and variation in managerial jobs or to provide analytical tools for handling that diversity. (p. 93)

Hales also states that:

There is, therefore, a need for more research which seeks to identify role prescriptions, expectations or demands – whether undertaken through an examination of formal job descriptions or through an investigation of the expectations held by all the members of a manager’s role-set. This, again, suggests the need to examine the ‘managerial’ function. The nature of that function within organizations and how it is divided among different managerial jobs is crucially important in defining managerial

responsibilities and tasks. (p. 109)

Barber and Tietje (2004) wrote: “The challenge for future research is to develop a competency model that identifies specific tasks and behaviors that manifest the competencies we have identified” (p. 604). Delbridge and Lowe (1997) stated that “supervisors remain under-theorised in the literature, particularly as social actors. Thus, despite significant changes in the nature of work over the last few decades, the situation of supervisors is regularly inferred rather than analysed” (p. 409). They also stated that few studies have made the supervisor the primary subject in the contemporary workplace. Whitley (1989) in speaking of prior research utilizing observational techniques said: “These attempts to specify and justify the nature of managerial activities have been sharply criticized for their lack of empirical foundations and their vagueness, if not vacuity” (p. 210). Sayles (1989) wrote that: “But, more damning, the studies that have been done have tended to stress what managers should think and what they should achieve. Ignored is the real pay dirt – *how do you do it?*” (p. 3). Stewart (1982) wrote that the research to date had not focused on what managers actually do, that it was too general and too divorced from reality.

Tasks from Prior Studies

Searching the literature, seven studies (see Table 1) were found that tangentially touched upon the tasks and responsibilities of a first-line supervisor. Usually the tasks described were not tasks at all but activities, or groupings of tasks. The most relevant to this study was the last study listed in Table 1, done by Hales in 2005. The studies are presented chronologically, and each will have a brief description of the studies purpose, methodology and tasks found.

Table 1

Seven Prior Studies Discussed

Study	Author	Year
Of Time and the Foreman	Guest	1956
Building on Mintzberg	McCall and Segrist	1980
Managers at Work	Allan	1981
Performance Based Supervisory Development	Macdonald	1982
Toward an Observation System LOS	Luthans and Lockwood	1984
The Role of a Manager	Kraut, Pedigo, Mckenna & Dunnette	1989
Role of the First-Line Manager	Hales	2005

Of Time and the Foreman

The study by Guest in 1956 was intended to actually observe what a supervisor does on the plant floor. He wrote: “Some time ago, a plant manager in a large, progressive American company said to us, ‘You know, I’d like to know what a foreman does, what he *really* does’” (p. 478). This study by Guest was conducted to answer that question, and had the opportunity to record the tasks of the supervisors. What it really did was record the time spent on each visual activity, whether that was in the performance of a task of the job or not. They observed in detail 56 production foremen on an automobile assembly line for an eight hour day, which was 27,000 minutes of observation. The observer recorded each incident in which the foreman did something. At the end of the day, the time spent on each different incident was accumulated, and a report developed, which eventually a copy was given to the foreman and a copy was retained by the researchers. “The incidents were classified under 15 topics, and the observations coded accordingly. The topics and the average percentage of time spent by the foreman on each of them are shown in the accompanying table” (p. 481).

Table 2

Average Amounts of time Spent by Foreman on Each Topic

Topic	Percent of Time	Topic	Percent of Time
Quality	18.2	Production Schedule	5.2
Work Progress	13.2	Grievances	2.0
Personnel Administration	11.2	Injury, illness	1.2
Personal relations and other		Housekeeping	.5
Non-job related topic	10.2		
Foreman performance of an	8.1	Work standards	.4
Operation			
Tools, jigs, and fixtures	8.1	Safety	.2
Materials	8.0	Meeting	.1
Employee job performance	7.7	Miscellaneous	2.4
Topic unknown	2.4		

From "Of Time and the Foreman," by R. H. Guest, 1956, *Personnel*, 32(6), p. 481.

The author stated that the profile of time distribution was only a partial reflection of what the supervisor did on a daily basis. They had taken a snapshot of an eight hour period, so the study was skewed by what was observed during that period, and thus lacked the insight into all of the activities and tasks that the supervisor was responsible for performing. From Table 2, the topics were more in the realm of activities and not to the detail one could describe as tasks. Even though it is conducted in a manufacturing environment, it was on an assembly line and not in a job shop environment.

Building on Mintzberg

This study by McCall and Segrist in 1980 was intended to build on Mintzberg's 10 roles of a manager (Mintzberg, 1975). "This strategy involved three steps. First, reliable descriptive data from direct studies were identified. Second, an instrument was developed and validated. Third, survey results were compared with hypotheses drawn from the original observational study" (McCall & Segrist, 1980 p. 1). The authors developed 75 questionnaire items using Mintzberg's descriptions of activities within the

10 roles. The process used to develop these questionnaire items was not explained, and might lead one to wonder whether there was a bias towards supporting Mintzberg's role selection, since that was the purpose of the study. Each question was rated on a 7-point Likert scale. It was given to a random sample of one third of the managers, at all levels, of a large manufacturing organization, with a 68.3 response rate. Their results showed that of the 10 roles prescribed by Mintzberg, 6 had psychometric integrity. The strength of this past research to this current study is the questionnaire items developed by the authors. "Based on data from nearly 3,000 managers, the results of item analysis, confirmed by factor analysis, show that six of the ten roles have psychometric integrity" (McCall & Segrist, 1980 p. 2). Of the 75 items developed from the 10 roles of Mintzberg, 46 items remained from the 6 remaining roles. These 46 items, which are similar to tasks, can be seen in Table 3.

Table 3

Task Developed from Six of Mintzberg's Roles

Tasks Based on Mintzberg's Managerial Roles

1. LEADER

- Evaluating the quality of subordinate job performance.
- Integrating subordinates' goals (e.g., career goals, work preferences) with the Company's work requirements.
- Keeping in touch with and helping subordinates with personal problems (maintaining their trust and confidence).
- Resolving conflicts between subordinates.
- Keeping track of subordinates' training and special skills as they relate to job assignments-so as to facilitate their personal growth and development.
- Allocating manpower to specific jobs or tasks.
- Providing new employees with adequate training for and introduction to the job at hand.
- Seeing to it that subordinates are alert to problems that need attention.
- Using your authority to insure that your subordinates accomplish important tasks.
- Maintaining supervision over changes in your organization.
- Providing guidance to your subordinates on the basis of your understanding of the

organization.

Giving negative feedback (criticizing subordinates' actions when appropriate).

Directing the work of your subordinates.

Forwarding important information to your subordinates.

2. LIAISON

Maintaining your personal network of contacts through visits or phone calls.

Attending social functions which allow you to keep up your contacts.

Attending conferences or meetings to maintain your contacts.

Attending social functions as a representative of your organization.

Joining boards, organizations, clubs, etc., which might provide useful, work-related contacts.

Staying attuned to the grapevine.

Developing new contacts by answering requests for information.

Developing personal relationships with people outside your unit who feed you work or services (e.g., purchasing, suppliers, consultants, inspectors, etc.).

Developing contacts with important people outside your immediate organization.

3. MONITOR

Assessing political events as they may affect your work.

Keeping up with market changes and trends that might have an impact on your organization.

Keeping up with information on the progress of operations in the Company.

Keeping up with technological developments related to your work or to the Company.

Gathering information about trends outside your organization.

Gathering information about customers, competitor, associates, etc.

Touring facilities for observational purposes.

Learning about new ideas originating outside of your organization.

Reading reports on activities in your own or other company organizations.

4. SPOKESMAN

Presiding at meetings as a representative of your organization.

Serving as an expert to people outside of your immediate organization.

Informing others of your organization's future plans.

Answering letters or inquiries on behalf of your organization.

Keeping other people informed about your organization's activities and plans.

5. ENTREPRENEUR

Planning and implementing change.

Initiating controlled change in your unit.

Solving problems by instituting needed changes in your organization.

6. RESOURCE ALLOCATOR

Distributing budgeted resources.

Making decisions about time parameters for upcoming programs.

Preventing the loss or threat of loss of resources valued by your organization.

Allocating monies within your unit.

Deciding which programs to provide resources (manpower, material, dollars, etc.) for.

Allocating equipment or materials.

Adapted from *In Pursuit of the Manager's Job: Building on Mintzberg* (Technical Report Number 14), by M. W. McCall & C. A. Segrist, 1980, Greensboro, NC: Center for Creative Leadership, pp. 19-24. The intercorrelation data has been removed, as the significant data is the items.

Managers at Work

This was a study done in 1981 by Peter Allan, a researcher in the Department of Personnel in the New York City (NYC) government, to ascertain whether there was a common core of managerial tasks common across the city government and common across all levels of management. The study was done in three phases. A draft questionnaire made up of task statements was developed from relevant literature and incumbent managers. The draft questionnaire was pre-tested by 40 managers. These task statements were revised, deleted or added from the responses of the pretested managers. The final questionnaire had 146 task statements. For each task statement, the manager would indicate the importance of that task on a 5-point Likert scale, and also indicate the time spend on each task, again on a 5-point Likert scale. Tasks ending up with an average importance score of less than 2 (on the 5-point scale of 0 to 4) and summed scores of both importance and time spent of less than 3 were dropped from the study. The final instrument was distributed to 1,550 managers, of whom 95% responded. A total of 57 tasks were identified as meeting the criteria of retention and thus identified as the common core of managerial tasks performed by the average manager. The results of the survey can be found in Table 4. Allan could not be contacted to delineate the individual tasks.

Table 4

Task Dimensions of NYC Managers at Management Levels I & II (Entry Level)

Task Dimensions

Supervision of employees II tasks): This dimension involved assigning work to

subordinates, developing them, appraising them, and assisting them with their work problems.

Harmonizing (10 tasks): Managers worked with superiors, peers, representatives of other agencies, organizations, and unions in harmonizing or integrating the work activities or parts of the organization by smoothing, persuading, and negotiating.

Information handling (15 tasks): The city manager was a focal point of communication involved in gathering, processing, and supplying information from within and without the organization.

Analytical-evaluative (9 tasks): Managers were required to analyze and evaluate laws, problems, programs, work procedures, processes, and reports.

Change-initiating (8 tasks): As change agents, managers engaged in activities aimed at changing the organization structure, tasks or procedures, or the behavior of people.

Monitoring (4 tasks): Managers were found to develop mechanisms for ensuring adequate progress toward goals, maintaining appropriate records, and inspecting ongoing activities.

Adapted from "Manages at Work: a Large-Scale Study of the Management Job in New York City Government." *Academy of Management Journal*, 24(3), pp. 616-617. The table is a combination of Tables 1 and 2 in the original article, edited to show only the Level I and II (entry level) managers. Managers of higher levels were not entry level and not equivalent to first-line supervisors.

The major categories were activities and were not tasks. This study was not conducted in a manufacturing environment, but in a governmental body.

Performance Based Supervisory Development

This study was published as a book by Macdonald in 1982, prepared by the AT&T job study groups, as a resource for training and training development, and was concerned principally with the job of first-line supervisors. It is described as the "first comprehensive study of generic managerial duties, tasks, skills, and knowledge made in the Bell System" (Macdonald, 1982, p. ix). The profile of the "ideal" first-level supervisor was based on intensive observation of a number of working supervisors who were identified by management as superior or "master" performers. The study focused on the generic aspects of supervision common to most supervisory jobs. The result, called the AT&T Skill/Knowledge Mastery Model was:

“A comprehensive in-depth *prescription* for the job of a first-level supervisor.

This model was performance-based and was constructed on a framework of the 14 principal duties of a supervisor, developed through the process just described, and in the sequence shown in the final listing. Each duty was viewed and presented as a *managerial process* – as series of steps to be followed for mastery of the duty.

The number of steps in a given process – tasks and decision points – varied with the complexity of the process” (p. 24).

The major tasks and subtasks can be found in Table 5.

Table 5

Major Tasks and Process Steps to be Followed for Mastery of the Major Task

Supervisory Tasks and Steps for Mastery

1. Process 1 – planning the work
 - a. Identify the factor that stimulates the planning
 - b. Determine the output requirements of the work
 - c. Examine information about this type of work
 - d. Identify needed resources to do the work in the prescribed manner
 - e. Determine whether available resources are adequate
 - f. Look for alternative methods
 - g. Contact the initiator of the planning
 - h. Present the alternative method to the initiator
 - i. Document rejection of the alternative method
 - j. Document acceptance of the alternative method
 - k. Identify planning checkpoints
 - l. Determine whether local procedures exist for recording checkpoints
 - m. Construct a master control list (or similar control document)
 - n. Record the checkpoints
 - o. Controlling the work

2. Process 2 – controlling the work
 - a. Assign the work
 - b. Check status of ongoing work against master control list
 - c. Log status of work on the master control list
 - d. Enter the problem solving process to do work
 - e. Obtain information about the completed work
 - f. Evaluate the completed work

- g. Determine causes of failure to meet output requirements
 - h. Enter the problems solving process to redo work
 - i. Document findings and results
3. Process 3 – problem solving
- a. Determine if a stimulus exists to solve a problem
 - b. Define the problem
 - c. Identify sources of information about the problem
 - d. Identify what identified source(s) to use
 - e. Obtain the data
 - f. Formulate possible solution(s)
 - g. Determine the best solution
 - h. Implement the selected solution
 - i. Determine if documentation is necessary and/or if the source of the stimulus needs to be informed of the solution
 - j. End of problem solving process
 - k. Document and/or inform
4. Process 4 – providing performance feedback
- a. Determine that a stimulus exists for giving feedback to a particular subordinate
 - b. Determine whether enough job performance data exists to give feedback
 - c. Collect additional job performance data
 - d. Prepare for giving the ongoing feedback
 - e. Meet with the subordinate
 - f. Set and maintain a constructive tone
 - g. Describe the subordinate's performance
 - h. Obtain from the subordinate data about his or her performance
 - i. Evaluate the data obtained from the subordinate
 - j. Discuss consequences, both positive and negative, of the subordinate's performance
 - k. Check for subordinate's understanding of the feedback and the impact of the performance
 - l. Set a date for follow-up review with the subordinate
 - m. Document the points covered with the subordinate during the ongoing feedback
 - n. Prepare for total [formal] performance review with a subordinate
 - o. Collect the performance results data
 - p. Compare the performance results data against agreed-upon levels of performance
 - q. Prepare a performance appraisal
 - r. Schedule a total performance review with the subordinate
 - s. Meet with the subordinate
 - t. Set and maintain a constructive tone
 - u. Review the subordinates performance
 - v. Gain agreement on the levels of performance for the next total

- performance review period
- w. Make final plan for maintaining and/or improving performance results
- x. Close the total performance review

5. Process 5 – coaching a subordinate
 - a. Determine that a stimulus for coaching a subordinate exists.
 - b. Determine whether or not the subordinate has the capability to improve work performance
 - c. Give the subordinate an assignment where the identified capabilities can best be utilized
 - d. Arrange to meet with the subordinate
 - e. Prepare for meeting with the subordinate
 - f. Meet with the subordinate
 - g. Set and maintain constructive tone
 - h. Go to career counseling process
 - i. Prepare for meeting with the subordinate
 - j. List the performance area the subordinate needs to improve
 - k. Identify the methods to improve the subordinates performance
 - l. Choose the most effective method
 - m. Meet with the subordinate
 - n. Set and maintain a constructive tone
 - o. Describe the subordinates work performance
 - p. Review the comparison of the subordinate’s work performance to the work standards
 - q. Implement the selected method for improving the subordinate’s work performance
 - r. Check for subordinate’s understanding of the correct way to perform the work
 - s. Make follow-up plans with the subordinate
 - t. Document the coaching session
 - u. go to provide performance feedback process

6. Process 6 – creating and maintaining a motivative atmosphere
 - a. List the activities that lead to a motivative atmosphere
 - b. List the indicators of a motivative atmosphere
 - c. Observe the subordinate’s behavior
 - d. Compare your observations to the list of indicators
 - e. Determine the discrepancy warrants corrective action
 - f. Determine if subordinate’s input is required to take action
 - g. Enter the problem solving process
 - h. Prepare to meet with the subordinate
 - i. Meet with the subordinate
 - j. Set and maintain a constructive tone
 - k. Describe to the subordinate the observed behavior
 - l. Obtain from the subordinate data about the observed behavior
 - m. Enter the problem solving process

7. Process 7 – time management
 - a. Select an area in which to apply the time management process
 - b. Selected area: managing telephone calls
 - c. Selected area: managing incoming paper flow
 - d. Selected area: “to do” system
 - e. Make a “to do” list
 - f. Prioritize the items on the “to do” list
 - g. Go to the planning process
 - h. Do the remaining items on the “to do” list in priority order
 - i. Determine if the “to do” list need updating.

8. Process 8 – communications
 - a. Determine that a stimulus for communication exists
 - b. Select a method to communicate
 - c. Selected method: oral communication
 - d. Selected method: written communication
 - e. Go to informal oral communication
 - f. Go to formal oral communication

9. Process 9 – informal oral communication
 - a. Identify the participants for the communication process
 - b. Determine the time for the process to take place
 - c. Determine the place for the process to take place
 - d. Determine if the participants need advance notice
 - e. Give advance notice
 - f. Meet with the participants
 - g. Set and maintain a constructive tone
 - h. Select a method for communication
 - i. Select method: interviewing
 - j. Select method: discussing
 - k. Select method: negotiating
 - l. Determine if the purpose of the informal oral communication has been achieved
 - m. Go to the problem solving process
 - n. Determine if follow-up is needed
 - o. Follow-up on informal oral communication
 - p. End the informal oral communication
 - q. Determine if documentation is needed
 - r. Document the informal oral communication
 - s. End the process

10. Process 10 – self-development
 - a. Determine your job requirements to produce results on your current job
 - b. Assess yourself against the job requirements
 - c. Maintain your current job performance

- d. List performance areas where improvement is needed
- e. Prioritize the improvement areas
- f. Select a method to improve performance
- g. Make a performance development plan
- h. Implement your performance development plan

11. Process 11 – written communication

- a. Determine when the written communication or documentation is due
- b. List the general ideas you want to communicate
- c. Determine sources of the information
- d. Collect the information
- e. Analyze the information
- f. Produce an outline
- g. Select a format
- h. Produce the written communication and/or documentation
- i. Determine whether the written communication and/or documentation is ready for release
- j. Revise the written communication and/or documentation
- k. Release the written communication and/or documentation

12. Process 12 – knowledgeable representation of the company

- a. Determine if there is an occasion, a need, or a stimulus to represent the company
- b. Determine your required level of knowledge
- c. Determine the sources of the knowledge you need
- d. Obtain the knowledge
- e. Represent the company on the appropriate occasions

13. Process 13 – career counseling a subordinate

- a. Determine that a stimulus for career counseling a subordinate exists
- b. Arrange to meet with the subordinate
- c. Prepare for career counseling meeting
- d. Meet with the subordinate
- e. Set and maintain constructive tone
- f. Interview the subordinate to determine if subordinate wants a more challenging assignment on present job
- g. Determine areas in which to offer more challenging assignments
- h. Assign work to subordinate in challenging area
- i. Document the session and its results
- j. Go to provide performance feedback
- k. Document for the total performance review
- l. Determine the requirement of the new job
- m. Determine subordinate's qualifications with respect to the new job requirements
- n. Follow local company procedures to place the subordinate in the new job
- o. Plan activities to help subordinate qualify for the new job

- p. Implement the planned activities
- q. Document the results of the career counseling

14. Process 14 – meetings (formal oral communication)

- a. Are you leading the meeting or attending the meeting as a conferee?
- b. If leading the meeting, list points to be covered
- c. If leading the meeting, prepare for the meeting
- d. If leading the meeting, prioritize the things to do and/or get
- e. If leading the meeting, identify the participants
- f. If leading the meeting, select time and place for the meeting
- g. If leading the meeting, notify the participants
- h. If leading the meeting, do and/or get prioritized items on list from item d above
- i. If leading the meeting, meet with the participants
- j. If leading the meeting, open the meeting
- k. If leading the meeting, cover the points on your agenda
- l. If leading the meeting, determine if the purpose of the meeting have been achieved
- m. If leading the meeting, enter the problem solving process
- n. If leading the meeting, summarize conclusions and commitments made
- o. If leading the meeting, close the meeting
- p. If leading the meeting, document the meeting
- q. If attending the meeting, prepare for the meeting
- r. If attending the meeting, participate in the meeting
- s. If attending the meeting, follow-up on meeting results (if appropriate)

From *Performance Based Supervisory Development*, by C. R. MacDonald, 1982, Amherst, MA: Human Resource Development Press. This table is a summary of most of the content of the book, pp 30-180.

The major categories were activities and not tasks, and the apparent subtasks were not tasks at all, but a flow chart or guide as to how to become proficient on the activities. Tasks were not presented at all. This study was not conducted in a pure manufacturing environment, but in a telephony utility. Even though some of the supervisors were from the manufacturing arm of AT&T, Western Electric, it cannot be ascertained as to what extent the mix included manufacturing positions. Western Electric in 1982 was the production arm of the AT&T system. The production of large batches or assembly line production, which was required to supply the entire Bell (AT&T) Telephone System in 1982, is not characteristic of a job shop manufacturing environment (Woodward, 1994).

Toward an Observation System LOS

The intent of a study by Luthans and Lockwood in 1984 was “to make a preliminary assessment of a newly developed leader observation system (LOS) for the measurement of leader behavior in natural settings” (p. 118). The LOS was developed in two phases. The first phase was observational where 44 leaders were observed at different times and days, and their activities recorded. After two weeks, the observed managers rated the behaviors recorded as typical of their behavior on a scale of 1 to 5. Any behavior with a mean rating of 3.9 or greater was defined as typical and kept for the second phase. During phase two, the behaviors identified as typical were put into comprehensive and workable categories, by means of a Delphi process. “The Delphi panel consisted of four persons with considerable academic work in management/ leadership and three graduate students from outside the disciplines who were completely naïve with respect to prior leadership research” (p. 120). After multiple iterations, 12 categories were established to contain the behaviors observed on the first round. The results of this effort can be found in Table 6.

Table 6

The Leader Observation System Categories and Behavioral Descriptors

Leader Behavioral Descriptors

Planning/Coordinating

- a. setting goals & objectives
- b. defining tasks needed to accomplish goals
- c. scheduling employees, timetables
- d. assigning tasks and providing routine instructions
- e. coordinating activities of each subordinate to keep work running smoothly
- f. organizing the work

Staffing

- a. developing job descriptions for position openings

- b. reviewing applications
- c. interviewing applicants
- d. hiring
- e. contacting applicants to inform them of being hired or not
- f. "filling in" where needed

Training/Developing

- a. orienting employees, arranging for training seminars, etc.
- b. clarifying roles, duties, job descriptions
- c. coaching, mentoring, walking subordinates through task
- d. helping subordinates with personal development plans

Decision Making/Problem Solving

- a. defining problems
- b. choosing between 2 or more alternatives or strategies
- c. handling day-to-day operational crises as they arise
- d. weighing the trade-offs; cost benefit analyses
- e. actually deciding what to do
- f. developing new procedures to increase efficiency

Processing Paperwork

- a. processing mail
- b. reading reports, in-box
- c. writing reports, memos, letters, etc.
- d. routine financial reporting and bookkeeping
- e. general desk work

Exchanging Routine Information

- a. answering routine procedural questions
- b. receiving and disseminating requested information
- c. conveying results of meetings
- d. giving or receiving routine information over the phone
- e. staff meetings of an informational nature (e.g., status updates, new company policies, etc.)

Monitoring/Controlling Performance

- a. inspecting work
- b. walking around and checking things out, touring
- c. monitoring performance data. (e.g., computer printouts, production, financial reports)
- d. preventive maintenance

Motivating/Reinforcing

- a. allocating formal organizational rewards
- b. asking for input, participation
- c. conveying appreciation, compliments

- d. giving credit where due
- e. listening to suggestions
- f. giving position performance feedback
- g. increasing job challenge
- h. delegating responsibility & authority
- i. letting subordinates determine how to do their own work
- j. sticking up for the group to superiors and others, backing a subordinate

Disciplining/Punishing

- a. enforcing rules and policies
- b. nonverbal glaring, harassment
- c. demotion, firing, layoff
- d. any formal organizational reprimand or notice
- e. "chewing out" a subordinate, criticizing
- f. giving negative performance feedback

Interacting With Outsiders

- a. public relations
- b. customers
- c. contacts with suppliers, vendors
- d. external meetings
- e. community-service activities

Managing Conflict

- a. managing interpersonal conflict between subordinates or others
- b. appealing to higher authority to resolve a dispute
- c. appealing to 3rd-party negotiators
- d. trying to get cooperation or consensus between conflicting parties
- e. attempting to resolve conflicts between subordinate and self

Socializing/Politicking

- a. nonwork related chit chat (e.g., family or personal matters)
- b. informal "joking around," B.S.
- c. discussing rumors, hearsay, grapevine
- d. complaining, griping, putting others down'
- e. politicking, gamesmanship

From "Toward an Observation System for Measuring Leader Behavior in Natural Settings" by F. Luthans and D. Lockwood in J. G. Hunt, D. Hoskins, C. Schriesheim, & R. Stewart (Eds.), *Leaders and Managers: International Perspectives on Managerial Behavior and Leadership*, 1984, New York: Pergamon Press, Table 7.1, p. 122.

The major categories were activities, and the apparent subtasks were not tasks at all, but behaviors. It is not clear in what environment this study was conducted.

The Role of a Manager

Kraut, Pedigo, McKenna and Dunnette (1989) conducted a study to determine the “differences in management roles and activities across different levels and functions” (p. 286). They created a questionnaire containing 57 managerial tasks from extensive review of research and managerial activities. “Despite, or perhaps because, we used a literature search as the basis for our list of activities, some activities valued in this and other organizations may not have appeared in our survey” (p. 292). They received responses from 1,412 managers who rated the 57 managerial tasks on the relative importance of those tasks, using six categories, one being they do not perform the task. Of the 1,412 managers who responded, 658 were first-line managers. Using statistical analysis, they grouped the 57 tasks into seven sets of major factors or groups of management tasks. See Table 7 for the groupings. There are three management groups for each major factor: first-line supervisor, middle manager and executive. The percentage after each management category in each major factor represents the percentage of that management group that rated that major factor either of considerable importance or utmost importance. The percentage after each task under each major factor represents the percentage of all management groups that rated that task either of considerable importance or utmost importance. The percentage for each task was not broken out by management level, and that data was not available for this study.

Table 7

The Role of the Manager – The Results of the Survey

Managerial Roles

A. Supervision Individuals

1. Managing Individual performance (Supr 63% - Mngr 56% - Exec 45%)

- a. Motivate subordinates to change or improve their performance (76%)
 - b. Provide ongoing performance feedback to subordinates (76%)
 - c. Take action to resolve performance problems in your work group (69%)
 - d. Blend subordinates' goals (e.g., career goals, work performances) with company's work requirement (69%)
 - e. Identify ways of improving communications among subordinates (63%)
 - f. Keep track of subordinates' training and special skills as they relate to the job assignments to aid their growth and development (50%)
 - g. Resolve conflicts among subordinates (48%)
 - h. Discipline and/or terminate personnel (40%)
 - i. Review subordinates' work methods to identify ways to increase productivity (37%)
2. Instructing Subordinates (Supr 40% - Mngr 36% - Exec 27%)
- a. Inform subordinates about procedures and work assignments (52%)
 - b. Explain work assignments to subordinates (46%)
 - c. Provide technical expertise to help subordinates resolve work problems or questions (44%)
 - d. Train subordinates in new techniques or procedures (43%)
 - e. Schedule daily activities of subordinates (6%)
- B. Linking Groups**
1. Planning and Resource Allocation (Supr 47% - Mngr 66% - Exec 61%)
- a. Establish target dates for work products or services (72%)
 - b. Estimate resource requirements for operational needs (70%)
 - c. Develop evaluation criteria to measure progress and performance of operations (67%)
 - d. Decide which programs should be provided with resources (e.g., manpower, materials, funds, etc.) (65%)
 - e. Translate general directives (e.g., strategic plans) from superiors into specific operational plans/schedules/procedures, etc (63%)
 - f. Communicate the benefits or opportunities posed by a new idea, proposal, project, or program (58%)
 - g. Distributor budget resources (40%)
2. Coordinating Interdependent Groups (Supr 39% - Mngr 51% - Exec 54%)
- a. Stay informed of the goals, actions, and agenda of top management (70%)
 - b. Persuade other organizational groups to provide the information/products/resources needed by your work group (60%)
 - c. Monitor events, circumstances, or conditions outside your work group that may affect its goals and/or performance (58%)
 - d. Persuade other managers to provide support and/or resources for a new project or program (53%)
 - e. Set priorities for responding to other groups (51%)
 - f. Determine the possible effects of changes in the activities or outputs of your work group on other organizational groups (50%)
 - g. Maintain awareness of the goals and plans of other groups within the organization (45%)

- h. Negotiate working agreements, with other groups for the exchange of information, products, and/or services (44%)
 - i. Ensure coordination of activities and outputs of interdependent groups (43%)
 - j. Integrate the plans of related organizational groups (42%)
 - k. Provide advice or assistance to managers of other organizational groups (42%)
 - l. Disseminate information about the activities of your work groups to other work groups (39%)
 - m. Gather information on the needs/capabilities/resources (e.g., information, services) of other groups in the company (27%)
3. Managing Group Performance (Supr 22% - Mngr 48% - Exec 43%)
- a. Define areas of responsibility for managerial personnel (57%)
 - b. Inform manager when performance in their groups does not meet established goals or standards (50%)
 - c. Meet with managers to discuss the likely effects of changes on their groups (48%)
 - d. Monitor your work group's performance by reading reports, information system outputs, or other documents (44%)
 - e. Prepare production and productivity reports (25%)
 - f. Gather or review information on the activities and progress of several different work groups (23%)
- C. Monitoring the Business Environment
1. Monitoring the Environment (Supr 13% - Mngr 20% - Exec 34%)
- a. Develop/maintain relationships with management-level customers or clients from the outside business community (47%)
 - b. Participate in task forces to identify new business opportunities (38%)
 - c. Monitor sales performance and promotional activities (37%)
 - d. Gather information about trends outside your organization (36%)
 - e. Identify developing market trends (35%)
 - f. Develop/maintain relationships with management-level vendors or consultants in the business community (32%)
 - g. Consult on companywide problems (31%)
 - h. Attend outside meetings as a company representative (26%)
 - i. Monitor multinational business and economic trends (20%)
 - j. Release company information to the public (e.g., the new media)
- D. Representing People
1. Representing Own Work Group (Supr 51% - Mngr 55% - Exec 53%)
- a. Develop relationships with managers of other organizational groups that may be able to provide your work group with information/products/services/resources (68%)
 - b. Communicate the needs or requirements of your work group to managers of other organizational groups (59%)
 - c. Provide information on the status of work in your work group to managers

- of groups that depend on you for information/products/services/resources (58%)
- d. Determine the appropriate responses(s) to managers demanding information/products/services/resources from you work group (57%)
 - e. Provide information or assistance to subordinates interacting with other organizational groups (48%)
 - f. communicate capabilities and resources of your work group to other managers in the organization (46%)
 - g. Serve as an intermediary between your subordinates and managers of other organizational groups (39%)

From "The Role of Manager: What's Really Important in Different Management Jobs. *The Academy of Management Executive*, 3(4), by A. I. Kraut, P. R. Pedigo, D. D. McKenna & M. D. Dunnette, 1989. Numbers on the category headings refer to the percentage of First-Line Supervisors (Supr), Middle Managers (Mngr) and Executives (Exec) who said the task was of "the utmost" or "considerable" importance. The numbers on the tasks represents all respondents. Further breakdown per task was not available.

Role of First-Line Manager

The study by Hales in 2005 on the role of first-line managers was task based, with 2% of the informants in the manufacturing sector. The locale of Hales' study was in the London U.K. metropolitan area. Hales stated that "a sample survey was carried out to document how the FLM role was defined" (p. 480). His team surveyed 135 organizations using a structured questionnaire, with closed and open ended items, in a face-to-face interview process. The final demographics of the frame are shown in Table 8.

Table 8

Demographics of the Sample Frame for Hales Study (2005)

Demographics

1. Ownership
 - a. Private business – 83%
 - b. Public not-for-profit – 13%
 - c. Private not-for-profit – 4%
2. Nationality
 - a. British – 79%
 - b. US – 9%
 - c. European – 3%
 - d. Japanese – 2%
 - e. Mixed – 7%
3. Economic sector
 - a. Retail/wholesale – 13%

- b. Hotel/catering – 13%
 - c. Research/consultancy – 11%
 - d. Education – 8%
 - e. Leisure/entertainment – 7%
 - f. Banking/finance – 7%
 - g. Creative services – 5%
 - h. Property services – 4%
 - i. Recruitment/personnel services – 4%
 - j. Construction – 4%
 - k. Health/medical – 4%
 - l. Printing – 2%
 - m. Manufacturing – 2% [3 interviews]
 - n. Publishing – 2%
 - o. Communications/postal services – 2%
 - p. Legal services – 2%
 - q. Information/advice – 2%
 - r. Other services – 4%
4. Size (No. employees)
- a. Organization
 - i. Small (10-99) – 46%
 - ii. Medium (100-499) – 20%
 - iii. Large (500+) – 34%
 - b. Establishment
 - i. 10-29 – 39%
 - ii. 30-99 – 38%
 - iii. 100-499 – 19%
 - iv. 500+ -- 5%

From Table I “Rooted in Supervision, Branching Into Management: Continuity and Change in the Role of First-Line Managers. *Journal of Management Studies*, 42(3), by C. P. Hales, 2005.

Hales’ group interviewed what he called informants, which included senior line managers, HR/Personnel managers, function head or the first-line manager’s immediate supervisor. None were actual first-line supervisors. All of the informants were knowledgeable about the FLM role, and when interviewed, were asked to focus on that FLM role as the first-level of management in the organization. “Informants were asked to indicate whether various tasks/responsibilities formed part of the FLM role in their organizations and, if so, to rate how important a part of the role they were” (p. 484). The results shown in Table 9. In Table 9, the column “% orgns where part of FLM role” represents the percentage of interviewed organizations that felt that the task statement

was a part of the first-line manager (FLM) role within their organization. The column “% orgns where extremely imp/important” represents the percentage of interviewed organizations that felt that the task statement was either important or extremely important to the first-line manager role. In both cases, the results were by organization and not by individual first-line managers.

Table 9

First-Line Manager Tasks and Responsibilities Hales Study (2005)

Task/responsibility	% orgns where part of the FLM role	% orgns where extremely imp/important
Giving praise for good work	99	95
Checking quality of 'output'	99	95
Explaining production/work priorities	99	87
Carrying out operation work tasks	99	59
Monitoring work processes against procedures	98	84
Giving staff technical advice	98	82
Planning/scheduling work	98	82
Acting as communication channel up/down	98	80
Allocating staff to tasks	96	75
Giving ad hoc technical coaching	96	69
Assisting staff with work	96	68
Co-ordinating work of a team	95	79
Reporting performance upwards	94	77
Helping to implement changes in work practices	93	79
Dealing with immediate customer/client problems	92	83
Implementing efficiency improvements	92	68
Dealing with immediate work process problems	90	81
Dealing with immediate staffing problems	87	68
Attending action planning meetings	87	62
Checking quantity of 'output'	87	59
Attending review meetings	86	67
Authorizing non-routine actions by staff	85	36
Holding briefing meetings for staff	84	66
Dealing with immediate equipment problems	84	44
Checking cleanliness of work environment	83	49
Counseling staff	81	45
Handling computer data	79	54
Recommending staff for promotion	77	50

Substituting for staff during breaks	76	44
Informing staff about targets/business objectives	75	54
Allocating equipment to jobs	74	30
Dealing with immediate materials problems	73	47
Controlling operation costs	73	48
Conducting staff appraisals	71	59
Meetings with other FLMs	70	56
Managing a budget	65	48
Verbal warnings for breaches of discipline	63	44
Allocating staff to shifts/overtime	63	39
Dealing with immediate premises problems	63	37
Contributing to training programmes	61	31
Co-ordinating two or more teams	50	25
Setting a budget	39	23
Holding staff records	38	26
Written warnings for breaches of discipline	38	24

From Table II "Rooted in Supervision, Branching Into Management: Continuity and Change in the Role of First-Line Managers. *Journal of Management Studies*, 42(3), by C. P. Hales, 2005. Columns in Table II representing responsibility have been left out as not applicable.

All of the items in Table 9 appear to be task statements. The management level researched for this study was only the first level of management, first-line managers or supervisors. The respondents were a cross section of organizations in the greater London Metropolitan area. The results (percentages) where the task was evident and where the task was important was based on the number of organizations interviewed (135) and not the number of informants or the number of first-line supervisors.

Summary

The definition and role of a first-line supervisor varies by source. The government's definition includes any individual having authority, which could be of any level (NLRA, 1935). This study is focusing on first-line supervisor or first-line manager. In literature, researchers used the term interchangeably (Delbridge & Lowe, 1997; Dunkerley, 1975; Hill, 2003; Kelly, 1993; Kerr, Hill, & Broedling, 1986; Lisoski, 2005; Lowe, 1993; Macdonald, 1982; Robbins & Decenzo, 2004; Senker, 1995; Steinmetz & Todd, 1992; Walker, Guest, & Turner, 1956). The generally accepted definition of a

supervisor in an industrial environment is to supervisor workers (Delbridge & Lowe, 1997; Dunkerley, 1975; Hales, 2005; Hill, 2003; Kelly, 1993; Kerr et al., 1986; Lisoski, 2005; Lowe, 1993; Macdonald, 1982; Robbins & Decenzo, 2004; Rose, Newby & Vogler, 1987; Senker, 1995; Steinmetz & Todd, 1992; Walker et al., 1956). The study used this definition of a supervisor.

The definition of tasks and responsibilities also varies. Gael's (1983) definition of a task was used in this study. He defined task as a discrete organized unit of work with a defined starting and stopping point, and performed to accomplish a specific job. He also required that the task statement start with an action verb and contain the verb's object in the statement.

Searching the literature, seven studies were found that tangentially touched upon the tasks and responsibilities of a first-line supervisor. Usually the tasks described were not tasks at all but activities, or groupings of tasks. The most relevant to this study was the last study listed, done by Hales in 2005. This study by Hales was task based, with 2% of the informants in the manufacturing sector. None of the informants were actual first-line supervisors. This study was the initial source for most of the task statements. Some of the other studies provided a few more task statements.

Chapter 3

METHODS

Introduction

This study's primary research method was based upon the Delphi survey process. In methodology, a mixed method strategy of both qualitative and quantitative approaches was used. The sequence used was to create an initial survey instrument from prior research, to subject that initial survey instrument to a pilot study review, to use the results for the three Delphi rounds, to perform a final round to compare actual hours with the Delphi results, and to analyze the results. The data gained from the research are presented in chapter 4. The analysis of the results is presented in chapter 5.

Research Design Theory

This study used a mixed methods procedure as described by Creswell in the text *Research Design* (2003). The mixed methods strategy is a combination of the qualitative and the quantitative approach. The qualitative approach employs strategies of inquiry such as narratives and case studies (Creswell, 2003). "Qualitative methods can be used to uncover and understand what lies behind any phenomenon about which little is yet known" (Strauss & Corbin, 1990, p. 19). Observation, interviews and diary are data collection methods frequently used in qualitative research, especially case studies. The quantitative approach employs strategies of inquiry such as experiments and surveys

(Creswell, 2003). Questionnaire is a common data collection technique in quantitative studies.

This study used an interview technique (qualitative approach) to refine, during the pilot study, the questionnaire developed from prior research. It used a survey technique (quantitative approach) to collect data using the questionnaire developed from the pilot study. The eventual goal was to measure the importance and time effort of those tasks and responsibilities.

The study started with qualitative data collection from prior research. This initial effort created the pilot study instrument, which was given to the pilot study panel, composed of three subject matter experts (SME) in supervision. The pilot panel did not evaluate the tasks to their relevance to a supervisor in a job shop environment, but rather to their clarity and understandability to a supervisor in Northwest Wisconsin. The finished product from this pilot study was the starting instrument for the Delphi panel. The next phase was the quantitative data collection and analysis. The third round provided the panel's conclusion on the final relative importance of each task. The final and fourth round provided the time spent on each task in order to ascertain whether the tasks evaluated comprised the majority of the supervisors work week. Finally the results were interpreted and included the conclusions drawn from the entire process.

The Delphi Technique

The Delphi technique is a methodology to gather and refine the opinions of a group of people, usually a group of recognized experts, in order to synthesize their opinions into a consensus on the subject studied. It does not require face-to-face participation, and because it is anonymous, it is valuable in gaining consensus from a

group that might interact negatively, or create a politically or emotionally charged environment. It is especially useful where the panel participants are unable to meet together due to geographical or time constraints. This was the issue confronting this study, that of geographical and time constraints. The process was facilitated by the use of the Internet, which was the process used in this study.

Applications of the Delphi Process in this Study

Different researchers have divided or subdivided the Delphi process into multiple steps. Brooks (1979) used an eight step process. Linstone and Turoff (1975) divided the process into four phases. See Table 10 for the differences in the two processes. Many researchers highlighted or emphasized by extensive explanation two aspects of the Delphi process, in addition to the actual panel process, when describing their research methods. This study used a four phase process. Phase one consisted of the literature review, which was used to develop the initial or prototype task list, and which was the starting point for the pilot study. Phase two was the preparation incident to the Delphi process itself. This phase included the selection of the pilot study and Delphi panel members and the pilot study process itself. Phase three was the Delphi process. Phase four was the analysis, conclusion of the study and the reporting of the results.

Table 10

Different Steps in Delphi Process

Steps to the Delphi Process

Brooks (1979)

- Panel of experts identified
- Determine willingness of individuals to participate
- Gathering of individual input on given issues
- Analyzes the data provided by the panel
- Mailing of the assembled group-input to each panel member for assessment

Researcher's analysis of new input

Each panel member examine data and reassess his own position to group's responses

Researcher again analyzes and share input to panel members

Process continues until consensus is reached or until no further movement in Opinions

Linstone and Turoff (1975)

Exploration of the subject under discussion provided by each panel member

Reaching an understanding of how the group views the issue

If disagreement, bring out underlying reasons for disagreements and evaluate them

All information has been analyzed and fed back to the panel for consideration

Two issues that arose in most Delphi surveys were the selection or identification of the subject matter experts (SME) and the development of the first instrument to start the Delphi panel process (Costa, 2005; Kinley, 2001; Pesch, 1996; Scheele, 1975; Wilhelm, 1999; Zargari, Campbell, & Savage, 1995).

In the selection of Delphi panel members, the most important criterion was experience as a first-line supervisor in a job shop environment in a manufacturing role. It was important that the candidates, as subject matter experts, have the skill, knowledge, and experience of the tasks and responsibilities of first-line supervision in a manufacturing environment. In the prior research done by Hales (2005), the respondents were not the first-line supervisors but either their managers or observers such as human resource personnel. This study was interested in what the actual job holders, the first-line supervisor, perceived their tasks and responsibilities to be, rather than another person observing what their tasks and responsibilities are or should be. Brannick and Levin (2002) noted that "should circumstances, require, technical panels of carefully selected job experts with broad experience in the job under study can provide ratings very similar to large samples of incumbents" (p.58). This study chose not to search out a panel of

“carefully selected job experts with broad experience” (p.58) and instead create a panel of incumbents, all of whom have more than five years of supervisory experience doing the very tasks that they were asked to evaluate.

The second issue was in regard to the seed or first round of questions to start the panel process. The pilot study synthesized an initial list of tasks and responsibilities from the literature review and pilot tested it on subject matter experts (SME), who were supervisors with more than five years experience.

Pilot Study and Initial Instrument

Pilot Panel Composition

The supervisors chosen for the pilot study were not candidates for the Delphi panel. By having the pilot study supervisors also on the Delphi panel could create the possibility of an availability heuristic bias due to ease of recall, retrieveability and presumed associations (Bazerman, 1994). The pilot study candidates were selected on their experience as supervisors, and their professed fluency in reading information written in British English, and not on their association with the job shop manufacturing environment. This was important because some of the prior research had been done in the United Kingdom, and the task statements were written in British English. The pilot study panel’s function was only to insure that the survey instrument was understandable to an American supervisor, and that all of the word definitions were clear to them.

Pilot Panel Process

The task of the pilot study was to evaluate the initial instrument developed from the results of prior research discussed in the literature review. The participants determined if the format of the instrument is clear, that the meanings of the words were

within the common vernacular of a practicing supervisor, and to insure that they are able to follow the instrument's instructions. They did not add any tasks. The result of the pilot study was the instrument used in the first round of the Delphi process.

The initial seed for the pilot study was developed from the results of prior research discussed in the literature review. The tasks defined by Hale (2005) in the section titled *Role of First-Line Manager* was used as a starting point, arranged in alphabetical order so as not to influence the pilot study participants. These tasks can be found in Chapter 2, Table 9. The expectation would be that even though many of the tasks and responsibilities from Hales study would be the same as this study, their relative importance and order of importance might change. The most important task of the pilot study was to insure that the tasks were understandable and clear. Three pilot panel members participated in this activity, each working independently from each other. The researcher combined their efforts into one task list.

Survey Instrument Development

The researcher then compared the pilot panel's task list with the tasks found in the following studies: *Building on Mintzberg* (McCall & Segrist, 1980), *Toward an Observation System LOS* (Luthans & Lockwood, 1984), and *The Role of a Manager* (Kraut, Pedigo, McKenna, & Dunnette, 1989). After comparing the tasks on the tasks lists from the other studies, the research found that there were only three tasks from these other studies not encompassed by tasks on the original pilot study list. These three tasks were added to the pilot study list. The instrument used by the Delphi panel in their starting round of the Delphi process was the resulting list of tasks from the pilot study round. The task list was put in a Task Inventory format, similar to what Brannick and

Levin (2002) used in their research. It was a matrix, with the potential tasks listed alphabetically in the first column, with the second column for the Delphi panel member to indicate the importance of that task to their role as a first-line supervisor by means of a rating of the task as no importance (0), little importance (1), average importance (2), significant importance (3) and critical (4).

Delphi Panel

Panel Participants

The panel was composed of subject matter experts with five years experience in the area of first-line supervision on a job shop production floor. The success of the Delphi method depends on the proper selection of the panel of experts (Scheele, 1975; Ziglio, 1996).

Unfortunately, it is not possible to establish specific criteria for panel members since the needs would vary greatly given different applications. The key is simply that panel members be knowledgeable on the subject in question, represent as many different points of view as feasible, and be willing to share in a meaningful way their personal perceptions. (Brooks, 1979, p. 379)

Scheele (1975) found that:

Three kinds of panelists are ingredients for creating a successful mix: *stakeholders*, those who are or will be directly affected; *experts*, those who have an applicable specialty or relevant experience: and *facilitators*, those who have skills in clarifying, organizing, synthesizing, simulating.... (p. 68)

For this study, the panel consisted of current first-line supervisors in job shop environments, with no less than five years of supervisory experience in job shop manufacturing. Retaining their supervisory positions for at least five years suggested competence in that position. The supervisors have both the attributes of stakeholders and experts, using Scheele's definition, and the researcher served as the facilitator.

Size of Panel

The study was planned with having a panel between 15 and 20 subject matter expert (SME) members, the number depending upon the availability of appropriate experts who are willing to contribute the time to the study. At the onset, the panel had 20 members, but by the end of the study, this was reduced to 15 members. Brooks (1979) noted in reference to the number on the panel that "little agreement seems to exist concerning its optimum size. Delphi probes have involved numbers ranging from fewer than twenty to several hundred; however, it seems likely that little improvement in results is achieved with groups of more than twenty-five" (p. 377). Kinley (2001) in his research used only nine experts. Pesch (1996) used 15 panel members in his research on focused manufacturing. Wilhelm (1999) in looking at entry level skills in the workplace used a panel of 24. Zagari, Campbell, and Savage (1995) used a panel of 15 experts in their curriculum research on doctoral degrees in industrial technology. Dalkey (1969) observed that accuracy increases directly as the size of the panel increases up to 11 members, but levels off and does not improve dramatically after 11 panel members. Dalkey, Brown, and Cochran (1970) noted that a panel size of seven as the lower limit. They used in their research about 20 panelists. The actual experience during the study was to start with 20 panel members and finish with 15 panel members.

Source of Panel

This study was limited to supervisors in a job shop manufacturing environment. The panelists were not limited by who they worked for but by their expertise as panelists (Scheele, 1975). The Delphi study candidates were drawn from companies in Northwest Wisconsin. The Northwest Wisconsin Manufacturing Outreach Center (NWMOC), a unit of the Stout Technology Transfer Institute under the College of Science, Technology, Engineering and Mathematics at the University of Wisconsin – Stout, provided a list of their clients in Northwest Wisconsin that they considered job shops. Several of these candidate companies were not in Northwest Wisconsin, and were dropped from consideration. The researcher first mailed a letter to each candidate company, explaining the research project and explained that they would be contacted by phone as a follow-up within a few weeks of the letter. A copy of the letter is at Appendix A. The researcher contacted the plant managers or applicable managers at each firm by phone, explained the study to them, and requested a date in which the researcher could personally interview the potential supervisory panel members at that company. The researcher set up an interview schedule with the companies that were able to be contacted. Some companies did not return calls, so were relegated to a reserve roster. There was enough interest in the companies that had scheduled an interview to get twenty volunteers for the panel. Some supervisors who were anxious to participate in the study could not because they had not been supervisors for more than five years. Each company and each panel participant was promised a copy of the results when the study is completed.

Each potential candidate for the Delphi panel was individually interviewed by the researcher to explain the study and ascertain whether they would wish to participate or

not on the panel. The nature and requirements of the study was explained to each potential candidate. The researcher, after feeling comfortable that the supervisors were volunteers and not being coerced, had each potential panel member sign and date an informed consent form. A copy of that form is at Appendix B. This interview process identified twenty panel members. The candidates during the interview were informed that it would take some weeks before the first round would start, and that they would be notified by the researcher on a frequent basis as to the status of the effort leading up to the first round. This was done to maintain their interest in the study and to signify to the member that their future participation was important. A copy of the email sent to each candidate is at Appendix C. From the point of interviewing and signing consent forms to the first round, four of the twenty panel members dropped out of the study. All four drops were due to layoffs from their companies. The researcher made an attempt to contact them at their private residences, but to no avail. Because they dropped out due to layoffs before they saw the questionnaire, it is assumed that it did not affect the results. When the first round started, the panel had 16 members. One more panel member dropped out after the first round due to a combination of layoff and extended vacation making that panel member unavailable for more than a month. To wait more than a month for this member's input would have disrupted the flow of the study enough that the researcher took the step of dropping that member. Because of the situation, it is assumed that this did not affect the results. The number of panel members that completed the study was 15. This was the intended minimum number of panel members per the research plan.

Delphi Process

Each panel member was interviewed personally by the researcher to ascertain the level of computer literacy and availability for each panel member. All panel members had access to the Internet and email software. Originally it was intended to use an online web form and University of Wisconsin - Stout survey software, but problems with structuring the survey instrument resulted in the decision to use email as the means to communicate with the panel. It was important that the researcher be able to identify each panel member's survey submissions for each round because that member's responses needed to be returned to the panel member as additional information in the next round, along with the averages for the entire panel. The researcher also needed to know who had not yet responded in order to assist or nudge that panel member into supplying a response in a timely fashion. The software package was not set up to easily facilitate these requirements. For these reasons, each round was conducted via email, with the survey instrument matrix contained within the email.

Process Followed

The panel members were encouraged to add tasks and responsibilities not included in the initial list or seed. At any round, items could have been added, and the process would not have ended until all panel members had had at least one opportunity to evaluate and rate any new added tasks. Comments regarding any particular item were welcomed, if the panelist so wished to add them. Three new tasks were added during the process, which occurred only on the first round. The survey questionnaires can be found at APPENDICES D through F.

The mean of the rated tasks on the task list were calculated according to the responses of the panelists. The mean of each task along with the panelist prior response was sent back to the panelist for the next round. The panel members were then asked to re-rate the revised list, making suggestions for additions and deletions if they so wished. This did not happen after the first round. The revised list would be sent to the panel members as many times as it took to reach consensus.

Research shows that acceptable consensus is usually achieved by the third round (Brooks, 1979; Costa, 2005; Delbecq, Van de Ven, & Gustafson, 1986; Wilhelm, 1999; Zargari, Campbell, & Savage, 1995). Consensus amongst the Delphi panel members for the purpose of this survey was the point where three conditions of agreement were met. Firstly, it included when the panelists agreed that all tasks being rated were relevant in the task list, and that no new task was added to the list. Secondly, it was when the change in rating for each task, on a scale from 0 to 4, from round to round, changed less than 10% (.10). Thirdly, it was when the average total change, from round to round, for all tasks together was less than 5% (.05). Consensus for the purpose of this survey was the point where the Delphi survey rounds ceased, with the result being the data sought in the study. The range from .01 to .10, often referred to as the level of significance, was chosen because it is often used in testing as meaningful to reaching a conclusion (Glass & Hopkins, 1996; Lane, 2002; McClave & Benson, 1988; Minium, Clarke & Coladarci, 1999).

Consensus in this instance was reached when after the third round there were no new tasks added from the second round, and the rate change from the second to the third round from any single task was less than 10%, and the overall average rating change from

the second to the third round was less than 5%. After the third and final round another set of questions was asked. The panelists were asked to estimate the amount of time devoted to each task in an average or normal week. Each panelist's normal workweek in hours was also asked allowing their hour responses to be converted into a percentage of average time spent on a task. This allowed the tasks be normalized for all of the supervisors.

The task list was available only to the panel members. The nature of the task statements and the individual responses by each panel member was kept confidential. Extra effort was made to insure that the panel member's management did not become privy to the process, the questionnaires, or the individual responses. This was done to eliminate any possible outside influence on the supervisors from their management.

First Round

The first round was sent to 16 panel members. It was the resultant task and responsibilities list from the pilot study. A copy of the first round survey email sent to each candidate is at Appendix D. The panel members were instructed to rate the suggested tasks/responsibilities on a scale according to their relevance to their current supervisory experience. The task rating scheme was: no importance (0), little importance (1), average importance (2), significant importance (3) or critical importance (4) to their job as a first-line supervisor. The panel members were encouraged to add tasks and responsibilities not included in the initial list or seed. At any round, items could have been added, but the process did not end until all panel members had at least one opportunity to evaluate and rate any new added tasks. This only occurred on the first round where three new tasks were added to the list. Comments regarding any particular item were welcomed, if the panelist so wished to add them. The results were the mean

ratings from the entire panel for each task. This was calculated and used for feedback in the second round.

Second Round

The second round was sent to 16 panel members, but only 15 members responded. One panel member, due to a combination of layoff and vacation, was absent more than a month, and in order to advance the process, was dropped. That member never returned the second round survey instrument. The survey for the second round included two new columns of information not in the first round. A new column contained that panel member's responses on the first round, and a second new column contained the averaged responses of the entire panel for that item. Thus for the second round, the panel members were able to compare their rating for each task from the first round with the average rating of the entire panel for that task, and make a decision to either lower their rating, increase their rating or let it remain as in the first round. A copy of the second round survey email sent to each candidate is at Appendix E. This copy is what was actually sent to a panelist with his/her responses from the prior round in the second column titled "Your Response First Round." The task rating scheme was the same as on the first round and the order of the tasks on the survey were in the same order as the first round. An attempt was made to insure there was as little change in wording or survey matrix between the first and second rounds. The results were the mean ratings from the entire panel for each task. This was calculated and used for feedback in the second round. There were no additional tasks added from the third round.

Third Round

The third round was sent to 15 panel members. All 15 panel members responded. The survey for the third round included the two columns of information added in the second round. They contained that panel member's responses on the second round, and the averaged responses of the entire panel for that item from the second round. Thus for the third round, the panel members were again able to compare their rating for each task from the second round with the average rating of the entire panel for that task, and make a decision to either lower the rating, increase the rating or let it remain as in the second round. A copy of the third round survey email sent to each candidate is at Appendix F. This copy is what was actually sent to a panelist with their responses from the prior round in the second column titled "Your Response Second Round." The task rating scheme was the same as on the first and second rounds and the order of the tasks on the survey were in the same order as the first and second rounds. There was no change in wording or survey matrix between the first and second rounds. The results were the mean ratings from the entire panel for each task. This was calculated and used as the results of the survey. There were no additional tasks added from the third round.

Fourth Round

The fourth round did not ask to rate the importance of the tasks. It asked for the panel member to estimate the number of hours in the work week they spend on that task. The results of the third round were used to re-order the tasks, so that the task rated most important by the panel was first and the task least important was at the end of the list. A new "task" was added at the bottom where the panel member could put the time spent on all other tasks not included in the tasks above. The panel member was also asked to

respond with the total number of hours they worked in a week. The third round was sent to 15 panel members. All 15 panel members responded in some fashion. More than half responded such that the individual hours added up to many more hours than they worked in the week. With more than forty tasks and so much overlap, it was difficult to pin down the hours. After a couple of iterations, most of the panelists responded such that their total individual hours plus the other task option added up to their reported work week. If the panel member's individual tasks were within 10% of their work week hours, it was accepted. Of the 15 panelists, 8 had results that were exact. Four had responses that were close. Only three were and remained at the end of the project to be so far off that they could not be included in the data set. Thus there was responsive data from 12 of the 15 panel members. A copy of the fourth round survey email sent to each candidate is at Appendix G. The hours for each panel members was converted into a percentage of a work week. The task hour percentages were averaged resulting in the average percentage of the work week spent in each task. This was used to ascertain whether the survey instrument captured the majority of tasks and responsibilities of a supervisor by accounting for all or nearly all of the working hours in a week.

Analysis

From the results of the third round of the Delphi panel process; there was a list of tasks and responsibilities ordered by importance. The results of the fourth round were used to establish the average time spent for each task on the list. The time results were used to triangulate against the task list, comparing the time spent with task importance to determine if the task list accounted for most of the important tasks of a supervisor. If there was a major amount of time in the supervisor's day missing from the results of the

time survey, it would have been suggestive that some time-consuming tasks were omitted from the instrument. The threshold was if 80% of the work week was accounted for by the task list, then the task list was representative of a supervisors work week. This was based on a Pareto concept of item significance and insignificance, which “states that in any population that contributes to a common effect, a relatively few of the contributors – the vital few – account for the bulk of the effect. The principle applies widely in human affairs” (Juran & Godfrey, 1999, pp. 5.20-5.21). Usually the most important 20% of the items accounts for 80% of the cost or problems, or in this case time (Arnold, 2008).

Validity and Reliability

A proposed definition of validity is “the best approximation to the truth of a given proposition, inference, or conclusion” (Trochim, 2001, p.20). In this study the Delphi panel was composed of current supervisors in a job shop manufacturing environment with more than five years experience. They were to rate the importance to their position of a set of tasks, those tasks having been established by prior research. On the third round, this panel of subject matter experts reached consensus as to the importance of the many tasks they perform on a daily and weekly basis. This would suggest that a group of first-line supervisors were able to reach a consensus as to the importance of specific individual tasks to their job as supervisors, and this result was the intended outcome of this study. This would suggest that this outcome has validity in regards to purpose of this study.

A proposed definition of reliability is repeatability or consistency. “A measure is considered reliable if it would give you the same result over and over again (assuming that what you are measuring isn’t changing)” (Trochim, 2001, p.92). In this study 46

tasks were used from prior research. The panel added 3 more tasks. Of the 46 tasks from prior research, none were discarded. Of all 49 tasks, the lowest rating for two tasks was 1.9 on a scale from 0 to 4, and the next lowest 2.4. The panel's combined average rating from round two to round three did not change. That the tasks from prior studies were found to be valid to the subject matter experts, and the fact that their consensus from round two to three was on the average no change, it suggests that the tasks selection themselves and their ratings are repeatable and consistent.

Summary

Chapter 3 described the methodology used in this study. The research technique was described, followed by the process to create the initial survey instrument, the process that the pilot study performed in examining the instrument, the three rounds of the Delphi process itself in coming to a consensus on the importance of the tasks, the triangulation process which ascertained whether the identified tasks comprised more than 80% of the work week, and the final results. The next chapter, 4, delineates the actual results found from each of the steps just outlined.

Chapter 4

RESULTS

Introduction

The results from the research as performed and described in chapter 3 are presented in this chapter. The purpose of this study was to provide insight into the knowledge, skills, and abilities required of the first-line supervisor in a manufacturing environment. This was done by identifying the tasks and responsibilities of a first-line supervisor in a job shop manufacturing environment in Northwest Wisconsin. In this chapter those tasks and responsibilities are identified and ranked according to their importance to their job by a panel of subject matter experts, all first-line supervisors in a job shop manufacturing environment with more than five years experience.

These results were obtained by using a Delphi process for three rounds, which after the third round consensus was reached as the importance of the tasks. Each round after the first was a refinement of the prior round, in which the panel members were able to see the combined responses of the prior round, were able to see their responses on the prior round, and from that information were able to reconsider and make a new rating of importance for each task. After the third round, the criteria for consensus were met and the process stopped. The fourth round was the confirmation that the most important tasks were identified in the study by means of a triangulation round.

Pilot Study

The starting task list for the pilot study was the list of 44 tasks from Hale's study in 2005. That list is at Table 9, titled First-Line Manager Tasks and Responsibilities. Kraut, Pedigo, McKenna and Dunnette's study in 1989 provided a potential list of 57 tasks to draw from if a task on this list was not on the Hales list. That list is at Table 7, titled The Role of the Manager – The Results of the Survey. The tasks from Kraut, Pedigo, McKenna and Dunnette's study were compared with the tasks on Hale's list, and the researcher found that the Hales list included all of the tasks on the Kraut, Pedigo, McKenna and Dunnette study list, but two. Those two were added to the final list. This gave an initial task list of 46 tasks, which the three subject matter experts (SME) of the pilot study evaluated and changed the wording slightly when necessary to make it clear to a first-line supervisor in a job shop manufacturing environment in Northwest Wisconsin. This produced the initial instrument. This list can be seen in Table 11.

Table 11

Initial Survey Instrument Prior to Round One – 46 Task Statements

Task Statements

- Enforce cleanliness standards
- Enforce work rules and policies
- Explain work priorities
- Give verbal warnings
- Give written warnings
- Giving informal feedback on performance
- Handle immediate materials issues
- Help implement changes in work practices
- Hold formal performance reviews
- Implement efficiency improvements
- Keep management informed
- Keep workers and management informed
- Keep workers informed of goals and mission
- Maintain computer files and information

Maintain personnel records
 Manage multiple teams
 Manage work schedule
 Managing a budget
 Meet with other supervisors
 Motivate workers to change or improve their performance
 Perform work tasks
 Plan a budget
 Provide cover for staff to take breaks
 Provide on the job technical training
 Provide praise when deserved
 Provide workers technical advice
 Recommending promotions
 Resolve conflicts among workers
 Resolve immediate equipment problems
 Resolve immediate problems with production space
 Resolve immediate staffing problems
 Resolve immediate work flow or process problems
 Scheduling workers to shifts and overtime
 Spot check production amounts
 Spot check production quality

First Round

Only 16 of the initial list of 20 panel members responded to the first round survey, which can be seen in Appendix D. Three new tasks were added, and were given an initial rating of 3.0 in the matrix. These three tasks are the last three tasks on Table 12. The panel member submitting the task did rate them, but to start the task off for the entire panel the 3.0 rating was given, which was the original 46 tasks average rating. The 46 tasks, and with the three new tasks, had a combined average rating of 3.0. The rated task after the first round can be seen in Table 12.

Table 12

The Ratings of the 49 Tasks After the First Round

List of Tasks and Responsibilities	First Round Average Rating
Assign equipment to jobs	2.9
Assigning workers to jobs	3.4
Assist in worker training	2.6
Assist workers with tasks	2.5
Attending planning meetings	2.8
Attending review meetings	2.8
Authorizing non-routine actions by workers	2.4
Conduct team briefings	2.9
Controlling operations costs	3.1
Coordinating work of a team	3.3
Dealing with immediate customer/client concerns	2.8
Enforce cleanliness standards	2.9
Enforce work rules and policies	3.4
Explain work priorities	3.3
Give verbal warnings	3.1
Give written warnings	3.1
Giving informal feedback on performance	3.3
Handle immediate materials issues	3.1
Help implement changes in work practices	3.0
Hold formal performance reviews	3.3
Implement efficiency improvements	3.1
Keep management informed	3.5
Keep workers and management informed	3.6
Keep workers informed of goals and mission	3.3
Maintain computer files and information	2.7
Maintain personnel records	2.6
Manage multiple teams	2.8
Manage work schedule	3.2
Managing a budget	2.3
Meet with other supervisors	3.3
Motivate workers to change or improve their performance	3.4
Perform work tasks	3.1
Plan a budget	1.8
Provide cover for staff to take breaks	2.0
Provide on the job technical training	2.9
Provide praise when deserved	3.5
Provide workers technical advice	3.2

Recommending promotions	2.7
Resolve conflicts among workers	3.3
Resolve immediate equipment problems	3.6
Resolve immediate problems with production space	2.8
Resolve immediate staffing problems	3.3
Resolve immediate work flow or process problems	3.3
Scheduling workers to shifts and overtime	3.1
Spot check production amounts	2.9
Spot check production quality	3.1
Attend safety meetings, safety audits, safety training of people	3.0
Do hourly pay roll	3.0
Keeping track of vacation and personal time	3.0
Total Average	3.0

Rating range is from 0 to 4, 4 being the most important and 0 no importance.

Second Round

All 15 panel members responded to the second round survey, which can be seen at Appendix E. No new tasks were added. The 49 tasks had a combined average rating of 3.1. Two of the three criteria of consensus, in which the Delphi would cease, were met on the second round. There were no added tasks so the panel was able to evaluate all of the tasks. The total average change from round one to two was 2.0%, which was less than the threshold of 5%. But there were two individual tasks which changed more than 10%, thus requiring a third round. The rated task list after the third round can be seen in Table 13.

Table 13

The Ratings of the 49 Tasks After the Second Round

List of Tasks and Responsibilities	First Round Average Rating	Second Round Average Rating	Change from First to Second Round
Assign equipment to jobs	2.9	2.9	0.0%
Assigning workers to jobs	3.4	3.3	-3.0%
Assist in worker training	2.6	2.8	6.7%
Assist workers with tasks	2.5	2.5	0.0%

Attending planning meetings	2.8	3.0	6.7%
Attending review meetings	2.8	2.8	0.0%
Authorizing non-routine actions by workers	2.4	2.6	6.7%
Conduct team briefings	2.9	2.9	0.0%
Controlling operations costs	3.1	3.1	0.0%
Coordinating work of a team	3.3	3.3	0.0%
Dealing with immediate customer/client concerns	2.8	2.9	4.2%
Enforce cleanliness standards	2.9	2.9	0.0%
Enforce work rules and policies	3.4	3.4	0.0%
Explain work priorities	3.3	3.4	2.6%
Give verbal warnings	3.1	3.1	0.0%
Give written warnings	3.1	3.2	2.4%
Giving informal feedback on performance	3.3	3.3	0.0%
Handle immediate materials issues	3.1	3.3	6.7%
Help implement changes in work practices	3.0	3.2	6.7%
Hold formal performance reviews	3.3	3.3	0.0%
Implement efficiency improvements	3.1	3.3	8.8%
Keep management informed	3.5	3.6	2.9%
Keep workers and management informed	3.6	3.7	2.9%
Keep workers informed of goals and mission	3.3	3.5	4.7%
Maintain computer files and information	2.7	2.9	6.7%
Maintain personnel records	2.6	2.7	4.1%
Manage multiple teams	2.8	2.8	0.0%
Manage work schedule	3.2	3.3	2.5%
Managing a budget	2.3	2.4	6.7%
Meet with other supervisors	3.3	3.4	4.6%
Motivate workers to change or improve their performance	3.4	3.4	0.0%
Perform work tasks	3.1	3.1	0.0%
Plan a budget	1.8	1.9	6.7%
Provide cover for staff to take breaks	2.0	1.9	-6.7%
Provide on the job technical training	2.9	2.9	0.0%
Provide praise when deserved	3.5	3.7	6.7%
Provide workers technical advice	3.2	3.2	0.0%
Recommending promotions	2.7	2.8	4.2%
Resolve conflicts among workers	3.3	3.3	0.0%
Resolve immediate equipment problems	3.6	3.7	3.0%
Resolve immediate problems with production space	2.8	2.7	-0.6%
Resolve immediate staffing problems	3.3	3.4	4.6%
Resolve immediate work flow or process problems	3.3	3.3	0.0%
Scheduling workers to shifts and overtime	3.1	3.2	2.4%
Spot check production amounts	2.9	3.1	6.7%

Spot check production quality	3.1	3.1	0.0%
Attend safety meetings, audits, and training of people	3.0	2.8	-6.7%
Do hourly pay roll	3.0	2.7	-11.1%
Keeping track of vacation and personal time	3.0	2.7	-11.1%
Total Average	3.0	3.1	2.0%

Rating range is from 0 to 4, 4 being the most important and 0 no importance

Third Round

All 15 panel members responded to the third round survey, which can be seen at Appendix F. No new tasks were added. The 49 tasks had a combined average rating of 3.1. All of the three criteria of consensus, in which the Delphi would cease, were met on the third round. There were no added tasks so the panel was able to evaluate all of the tasks. The total average change from round two to three was 0.0%, which was less than the threshold of 5%. No individual tasks changed more than 10%, the greatest being a 6.4% change. Thus on the third round panel consensus was reached, and no further task ratings round were necessary. The rated task list after the third round can be seen at Table 14.

Table 14

The Rating of the 49 Tasks After the Third Round

List of Tasks and Responsibilities	Second Round Average Rating	Third Round Average Rating	Change from Second to Third Round
Assign equipment to jobs	2.9	3.1	4.5%
Assigning workers to jobs	3.3	3.3	0.0%
Assist in worker training	2.8	2.7	-2.4%
Assist workers with tasks	2.5	2.4	-2.7%
Attending planning meetings	3.0	2.9	-2.2%
Attending review meetings	2.8	2.7	-2.4%
Authorizing non-routine actions by workers	2.6	2.5	-5.1%
Conduct team briefings	2.9	3.1	4.5%

Controlling operations costs	3.1	3.1	0.0%
Coordinating work of a team	3.3	3.3	0.0%
Dealing with immediate customer/client concerns	2.9	2.8	-2.3%
Enforce cleanliness standards	2.9	2.8	-4.5%
Enforce work rules and policies	3.4	3.3	-2.0%
Explain work priorities	3.4	3.3	-2.0%
Give verbal warnings	3.1	3.1	0.0%
Give written warnings	3.2	3.1	-2.1%
Giving informal feedback on performance	3.3	3.3	0.0%
Handle immediate materials issues	3.3	3.4	4.1%
Help implement changes in work practices	3.2	3.3	2.1%
Hold formal performance reviews	3.3	3.3	0.0%
Implement efficiency improvements	3.3	3.4	2.0%
Keep management informed	3.6	3.7	3.7%
Keep workers and management informed	3.7	3.7	0.0%
Keep workers informed of goals and mission	3.5	3.5	0.0%
Maintain computer files and information	2.9	2.9	0.0%
Maintain personnel records	2.7	2.7	0.0%
Manage multiple teams	2.8	2.8	0.0%
Manage work schedule	3.3	3.2	-2.0%
Managing a budget	2.4	2.5	2.8%
Meet with other supervisors	3.4	3.5	2.0%
Motivate workers to change or improve their performance	3.4	3.4	0.0%
Perform work tasks	3.1	2.9	-6.4%
Plan a budget	1.9	1.9	0.0%
Provide cover for staff to take breaks	1.9	1.9	0.0%
Provide on the job technical training	2.9	2.9	0.0%
Provide praise when deserved	3.7	3.6	-3.6%
Provide workers technical advice	3.2	3.3	2.1%
Recommending promotions	2.8	2.8	0.0%
Resolve conflicts among workers	3.3	3.5	4.0%
Resolve immediate equipment problems	3.7	3.7	0.0%
Resolve immediate problems with production space	2.7	2.8	2.4%
Resolve immediate staffing problems	3.4	3.3	-2.0%
Resolve immediate work flow or process problems	3.3	3.4	2.0%
Scheduling workers to shifts and overtime	3.2	3.1	-2.1%
Spot check production amounts	3.1	3.1	0.0%
Spot check production quality	3.1	3.2	4.3%
Attend safety meetings, audits, and training of people	2.8	2.8	0.0%
Do hourly pay roll	2.7	2.7	0.0%
Keeping track of vacation and personal time	2.7	2.7	0.0%

Total Average	3.1	3.1	0.0%
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Rating range is from 0 to 4, 4 being the most important and 0 no importance.

Fourth Round

The fourth round was a triangulation round. It was intended to establish whether 80% or more of the average work week of the panel was spent on the 49 tasks in the survey. All 15 panel members responded to the fourth round survey, which can be seen at Appendix G. Only 12 of the 15 panel members returned data that could be used. The criteria was that the sum of the individual tasks in hours plus the sum of non-job related tasks not on the task list must be within 10% of the reported average work week. In a normal work week, there are many non-job related tasks performed such as eating, going to the rest room, socializing, and others, which take up time but do not rise to the level of being job related tasks. With so many tasks, it was difficult for the panel members to get the individual tasks to sum to their reported normal work week. In some cases, it took up to three iterations back and forth for the panel member to come within the 10%. Of the twelve panel members that responded so that their data could be used, nine returned data that exactly matched their total work week. All of the tasks were converted into percentages of a work week to compensate for the reported various work weeks, which ranged from 40 hours to 50 hours. Of the 12 panel members that responded with useable data, they estimated that 94.2% of their work week was dedicated to performing the tasks on the task list, with only 5.7% of their time spent on other tasks not on the list. This exceeded the initial criteria of having at least 80% of the work week accounted for by the tasks on the lists. The rated task list after the fourth round can be seen in Table 15.

Table 15

The Estimated Percentage of the Work Week Spent on the Various Tasks

TASK/RESPONSIBILITY	FINAL RESULTS 3RD ROUND	AVERAGE TIME SPENT ON TASKS
Keep management informed	3.7	3.8%
Keep workers and management informed	3.7	4.8%
Resolve immediate equipment problems	3.7	2.5%
Provide praise when deserved	3.6	1.6%
Keep workers informed of goals and mission	3.5	2.2%
Meet with other supervisors	3.5	4.8%
Resolve conflicts among workers	3.5	1.2%
Handle immediate materials issues	3.4	2.7%
Implement efficiency improvements	3.4	1.6%
Motivate workers to change or improve their performance	3.4	2.5%
Resolve immediate work flow or process problems	3.4	2.9%
Enforce work rules and policies	3.3	2.0%
Explain work priorities	3.3	2.6%
Hold formal performance reviews	3.3	0.7%
Resolve immediate staffing problems	3.3	1.5%
Assigning workers to jobs	3.3	4.0%
Coordinating work of a team	3.3	1.6%
Giving informal feedback on performance	3.3	1.2%
Help implement changes in work practices	3.3	1.4%
Provide workers technical advice	3.3	2.8%
Manage work schedule	3.2	5.2%
Spot check production quality	3.2	2.5%
Give written warnings	3.1	0.2%
Scheduling workers to shifts and overtime	3.1	1.4%
Spot check production amounts	3.1	1.6%
Assign equipment to jobs	3.1	1.6%
Conduct team briefings	3.1	2.0%
Controlling operations costs	3.1	0.7%
Give verbal warnings	3.1	0.6%
Attending planning meetings	2.9	1.9%
Perform work tasks	2.9	2.2%
Provide on the job technical training	2.9	1.9%
Maintain computer files and information	2.9	2.4%
Dealing with immediate customer/client concerns	2.8	3.5%

Enforce cleanliness standards	2.8	2.2%
Manage multiple teams	2.8	1.4%
Recommending promotions	2.8	0.3%
Resolve immediate problems with production space	2.8	2.6%
Attend safety meetings, audits, and training of people	2.8	1.5%
Assist in worker training	2.7	1.2%
Attending review meetings	2.7	1.7%
Maintain personnel records	2.7	0.9%
Do hourly pay roll	2.7	1.1%
Keeping track of vacation and personal time	2.7	0.8%
Authorizing non-routine actions by workers	2.5	0.8%
Managing a budget	2.5	0.4%
Assist workers with tasks	2.4	2.3%
Plan a budget	1.9	0.2%
Provide cover for staff to take breaks	1.9	0.6%
Subtotal for Tasks and Responsibilities		94.2%
Other Miscellaneous Tasks Performed During the Week		5.8%
TOTAL HOURS WORKED IN WEEK		100.0%

Summary

The results of the panel was a task list of 49 tasks, with an importance to their job rating range from 1.9 to 3.7, with 0 being of no importance, 1 being of little importance, 2 being of average importance, 3 being of significant importance, and 4 being of critical importance. The average rating for the entire list was 3.1. The final task list in sequence of importance is displayed at Table 15, first column titled “Final Results Third Round”. The panel estimated the time spent during their work week on each task is displayed at Table 15, second column titled “Average Time Spent on Task”. The total time spent on all 49 tasks accounted for 94.2% of their time, well above the criteria set for at least identifying the tasks taking up 80% of the work week.

Chapter 5

DISCUSSION

Introduction

Chapters 1 through 4 contained the problem, purpose and need of this study, a review of the literature impacting this study, the methodology used to conduct this study, and data obtained in the research for this study. This chapter provides a brief summary of the research, discusses the conclusions to be drawn from the research results, and provides recommendations for further research and study. This chapter will be organized into three sections: summary, conclusions and recommendations.

Summary

The problem of this study was to identify the tasks and responsibilities of first-line supervisors in a job-shop manufacturing environment in the Northwest Wisconsin portion of the United States. The purpose of this study was to provide insight into the knowledge, skills, and abilities required of first-line supervisors in a manufacturing environment. An understanding of these attributes would aid in the future selection of supervisory candidates, and it would assist corporate executives in the training and evaluation of personnel in supervisory positions.

The methodology of this research study used a modified Delphi study process, in that it went from the literature review to the development of the tasks and responsibilities

from the review of the prior research. The prior research was the initial instrument for the pilot study. The study was executed in four sequential phases, which at its conclusion provided a list of the tasks and responsibilities of a first-line supervisor in a job shop manufacturing environment in Northwestern Wisconsin. The first phase was a thorough literature review of work that had already been completed regarding managerial and supervisory tasks and responsibilities. The second phase was the pilot study and the enlistment of the panel members. The pilot study evaluated the initial instrument. The pilot study participants determined that the format of the instrument was clear and indicated that they were able to follow the instrument's instructions. The Delphi panel was composed of subject matter experts (SME), who through the Delphi process reached a consensus. This produced a mean rating on the importance of each task statement. The selection of the panel members or SMEs was critical to the success of the study. The third phase was the actual Delphi process using the assembled panel. The Internet and email was used to communicate. The fourth phase was the analysis and reporting of the results of the Delphi panel. Research shows that acceptable consensus is usually achieved by the third round, and this was the case in this study. Each of the participants who completed the study was given the final results of the process. All of the participating companies were also given the final results of the study. The results of the panel were analyzed and incorporated into the final dissertation.

Conclusions

The result of the panel was a task list of 49 tasks, with an importance to their job rating range from 1.9 to 3.7, with 0 being of no importance, 1 being of little importance, 2 being of average importance, 3 being of significant importance, and 4 being of critical

importance. The average rating for the entire list was 3.1. The final task list in sequence of importance is displayed in Table 15, first column titled “Final Results Third Round”. The panel estimated the time spent during their work week on each task and the results are displayed in Table 15, second column titled “Average Time Spent on Task”. The total time spent on all 49 tasks accounted for 94.2% of their time, well above the criteria set for identifying the tasks taking up 80% of the work week.

Using a Pareto concept of reviewing the top 20% or top 10 tasks as sorted for importance to the job, 7 of the top 10 tasks appeared to be most closely related to interpersonal communication and skills. See Table 16 for the top 10 rated tasks. They included such tasks as keeping management informed, keeping workers informed, praising workers when justified, meeting with other supervisors, resolving conflicts among workers and motivating workers to improve performance. These tasks only consumed 21% of their time, but constituted 7 of the top 10 most important tasks as viewed by the panel. These top 10 items had an average importance rating of 3.54, versus an overall rating of 3.1.

Table 16

Top 10 Tasks as Rated by Panel for Importance

Top 10 Most Important Tasks	Rating	% of Time
Keep management informed	3.7	3.8%
Keep workers and management informed	3.7	4.8%
Resolve immediate equipment problems	3.7	2.5%
Provide praise when deserved	3.6	1.6%
Keep workers informed of goals and mission	3.5	2.2%
Meet with other supervisors	3.5	4.8%
Resolve conflicts among workers	3.5	1.2%
Handle immediate materials issues	3.4	2.7%
Implement efficiency improvements	3.4	1.6%
Motivate workers to change or improve their performance	3.4	2.5%

Using a Pareto concept of looking at the top 20% or top 10 tasks as sorted by time spent performing the tasks, 7 of the top 10 tasks are related to operational issues. See Table 17 for the top 10 tasks sorted by time spent in the week. They included such tasks as managing work scheduling, assigning workers to tasks, dealing with immediate customer or client concerns, addressing work flow or process issues, giving technical advice, handling material issues, and production space issues. These tasks consumed 37.2% of their time, but constituted only 4 of the top 10 most important tasks as viewed by the panel. These top 10 items by time had an average importance rating of 3.31, versus an overall rating of 3.1, and as contrasted with the top 10 tasks by importance average rating of 3.54.

Table 17

Top 10 Tasks as Rated by Panel for Time Spent Performing Task

Top 10 Tasks for Time Spent	Rating	% Time
Manage work schedule	3.2	5.2%
Keep workers and management informed	3.7	4.8%
Meet with other supervisors	3.5	4.8%
Assigning workers to jobs	3.3	4.0%
Keep management informed	3.7	3.8%
Dealing with immediate customer/client concerns	2.8	3.5%
Resolve immediate work flow or process problems	3.4	2.9%
Provide workers technical advice	3.3	2.8%
Handle immediate materials issues	3.4	2.7%
Resolve immediate problems with production space	2.8	2.6%

In considering the top 10 tasks identified as important by supervisors, 7 of the top 10 are related to interpersonal skills, especially communication. But when the top 10 tasks that consume most of the time per task are considered, 7 of the top 10 involve

operational issues. This is in fact what the researcher would have expected. While it is more time consuming to work with the operational issues, it appears that the supervisors perceive the people to people interchanges as the most important part of their job. This might suggest that the specific operational environment that the supervisor works in is not as important as the interpersonal environment that the supervisor works in when performing their duties. The result was in contradiction to the Hales (2005) study.

Using the Hales study (2005) and the same Pareto concept of looking at the top 20% or top 10 tasks as sorted by importance, 7 of the top 10 tasks in the Hales' study (2005) are related to operational issues. See Table 18 for the top 10 tasks in the Hales study (2005). The full list of tasks from the Hales study is in Table 9. The operational tasks were: checking quality, explaining priorities, carrying out operational tasks, monitoring work processes, giving technical advice, planning and scheduling work, and allocating staff to tasks. Only three are interpersonal tasks: giving praise, being a communications channel, and technical coaching. Hales (2005) results are contradicted by the results of the current study.

Table 18

First-Line Manager Tasks Hales Study (2005) – Top 10 Items Only

Task/Responsibility	% orgns where part of FLM role	% orgns where extremely/imp/important
Giving praise for good work	99	95
Checking quality of 'output'	99	95
Explaining production/work priorities	99	87
Carrying out operation work tasks	99	59
Monitoring work processes against procedures	98	84
Giving staff technical advice	98	82
Planning/scheduling work	98	82
Acting as communication channel up/down	98	75
Allocating staff to tasks	96	75

Giving ad hoc technical coaching

96

69

Adapted from Table II "Rooted in Supervision, Branching Into Management: Continuity and Change in the Role of First-Line Managers. *Journal of Management Studies*, 42(3), by C. P. Hales, 2005. Columns in Table II representing responsibility have been left out as not applicable.

The initial task list for this study came from the Hales (2005) study. The breadth of that study was different than this study, wherein only 2% of Hales companies were in manufacturing, and the percent of those in job shop unknown, but less than 2%. The Hales study did not interview the first-line supervisors themselves, but their managers or knowledgeable observers. The Hales study had a different venue, the southern part of the United Kingdom versus Northwest Wisconsin. Because of these differences, the researcher did not have a hypothesis as to whether the results between the two studies would be similar or not. Comparing the top 10 tasks from the Hales study and this study appear to give different results, but that might not stand up with further analysis.

Recommendations

The purpose of this study was to develop a list of tasks and responsibilities of a first-line supervisor in a job shop manufacturing environment in Northwest Wisconsin. This was done through a panel of 15 subject matter experts using a Delphi process. The sample frame of tasks was triangulated by finding the number of hours spent on each task as a relationship to the entire work week, with the result being that the tasks on the task list comprised about 95% of the times spent during the week. The potential route to take for further research is to try and generalize the results of the panel by expanding the sample of first-line supervisors and by using the resulting data using task analysis techniques to arrive at a training program to train first-line supervisors in the most important tasks that they encounter in their job.

The most productive approach probably would be to retain the requirement of first-line supervisors with five years experience in a job shop manufacturing environment, and expand the geographical reach through a survey process. For instance, open up the sample frame from just Northwest Wisconsin to the entire state of Wisconsin, and then North Central United States to finally the United States. The instrument created by the Delphi panel could be used as the survey instrument. This would allow the researcher to generalize about the tasks and responsibilities of a supervisor throughout the United States, in a job shop manufacturing environment.

Next the research could be expanded to include all supervisors in job shop manufacturing environments to all manufacturing environments in the United States, keeping track by North American Industrial Classification System (NAICS), so as to differentiate different manufacturing processes within the United States. Then using the same instrument, the sample frame could be expanded to all first-line supervisors, not just those in manufacturing. This would be similar to the research that Hales did in the 2005 study, but located in the United States rather than a specific area in the United Kingdom.

One of the purposes of this study was to ascertain the tasks and responsibilities in order to develop training based upon empirical research. Through successive surveys, the sample frame could be widened to include more and more participants, enhancing the ability to generalize from the survey results. At any time a study to develop curricula using the results of the surveys to that point could be initiated. Using the survey results at that point, a Delphi study of educators or human resource education professionals could be conducted, developing curricula that would address the various tasks. From that curricula Delphi process, an instrument could be developed that would allow a wider

sampling and generalization of the results, thus leading to an empirically based first-line supervisor training program.

The need to adequately train first-line supervisors is fairly well known. It is essential for training of personnel in supervisory positions that the tasks and responsibilities be clearly known. The tasks generated from a survey either representative of all supervisors or manufacturing supervisors would be a good starting point to develop supervisor training. Using the results of the larger study, one or more Delphi panels of training experts could be assembled to develop a prototype curriculum, which could be confirmed by surveying a cross section of corporate and academic instructors. This would tie the actual job tasks and responsibilities in with the training provided. As studies were completed to update the tasks of supervisors, so to would this lead to studies confirming or updating curriculum meant to train those supervisors. This continuous tandem research, done to maintain current tasks and the courses to train those tasks, would be the eventual long-term goal of this study.

Most of the tasks for the initial task list for this study came from the Hales' (2005) study. Comparing the top 10 tasks from the Hales' study and this study appear to give different results in regards to the mix between operational and interpersonal tasks. Further study and analysis could be done to see if these differences actually exist and if so, why. Because of the initial appearance of these differences, the researcher can suggest three potential hypotheses as to why the results between the two studies appear to be different. The sample frame of the Hales' study was different than this study, wherein only 2% of Hales companies were in manufacturing, and the percent of those in job shop unknown, but less than 2%; whereas all of the data for this study was from a job shop

manufacturing environment. This might account for the difference, but the researcher feels this has low potential for an explanation because most of Hales' study was of firms in the service sector, thus implying that interpersonal skills would be far more, not less important, than this study. The Hales study had a different venue, the south of the United Kingdom versus Northwest Wisconsin. This could account for the difference, but again the researcher feels that this has low potential for explaining the differences. The manufacturing culture of the United Kingdom is not so different than the United States that such a difference should stand out.

The Hales study did not interview the first-line supervisors themselves, but their managers or knowledgeable observers. The researcher feels that this might account for the difference, in that the perception of what a supervisor does might be different between the supervisors themselves and their management. Is it possible that a supervisor's management discounts the interpersonal tasks and values the operational tasks more because that management depends on the operational tasks being done while management know they can do the interpersonal tasks themselves? This is an interesting question, and could suggest that research to correlate the difference between what the supervisor perceives as the important tasks and what the supervisor's management perceives as important tasks could lead to questioning communication between supervisors and management, the accuracy of job descriptions, and the accuracy of the supervisors performance evaluations. Comparing the supervisors' ratings and the managements' ratings could be a potential research study.

Another possible avenue of future research might be to run a blank Delphi study, starting with no initial tasks. This panel would then come up with the actual wording of

the tasks and responsibilities. This would require a through explanation to the panel members as to how to develop tasks; and probably would require two panels, one to develop tasks and another to rate those tasks.

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APPENDIX A: INTRODUCTORY LETTER

February 22, 2009

Company President.
Company
Street Address
City, WI Zip Code

Dear Mr. President,

I am an Assistant Professor at the University of Wisconsin – Stout researching the tasks and responsibilities of a first line supervisor in a manufacturing environment. I am looking for companies to participate in my research. The Northwest Wisconsin Manufacturing Outreach Center, here at UW-Stout, suggested that I contact you. For my research, I will need to interview and survey first line supervisors. The time commitment from the supervisors would be less than three hours spread over a couple of months.

The need for research in the tasks and responsibilities of a first-line supervisor, especially as it applies to manufacturing, has many marketplace origins. It is essential in the creation of supervisory positions, the selection of personnel for those positions, and that training of those selected that the tasks and responsibilities be clearly known. Also a job's tasks and responsibilities are needed in developing job descriptions and performance reviews, not only because it is good management practice, but because of anti-discrimination statutes and court rulings. It is not unusual for those responsible for creating job descriptions, hiring personnel for those positions, and developing training for supervisory personnel to have different views than those who currently perform supervisory functions.

If you agree to participate in this research project, the results of the research will be given to you so that you can use them in creating job descriptions, performance evaluations, position creations, and hiring of supervisory personnel. My only need is to be able to initially interview each supervisor, and then have them evaluate a list of tasks and responsibilities for three rounds.

I am hoping you will help me with this research project, and participate. I will call you in the next couple of weeks to answer any questions you might have, and to set up an appointment to visit with you, further explaining the nature of the research and the effort involved.

Sincerely,

Leonard Pederson
Assistant Professor
Department of Operations, Construction and Management
University of Wisconsin – Stout
Telephone: 715-232-2338

APPENDIX B: INFORMED CONSENT FORM

Indiana State University
 Institutional Review Board
 For Review of Research Involving Human Subjects
 INFORMED CONSENT FORM

DATE

A DELPHI STUDY TO INVESTIGATE THE TASKS AND RESPONSIBILITIES OF A FIRST-LINE SUPERVISOR IN A JOB SHOP MANUFACTURING ENVIRONMENT IN NORTHWEST WISCONSIN

You are being invited to participate in a research study to find out what the tasks are that a first-line supervisor does in a normal day at work. This study is being conducted by Leonard S. Pederson, Principal Investigator under the guidance of Dr. Gordon Minty, faculty advisor, from the Technology Management Department, School of Technology at Indiana State University. The study is being conducted as part of a dissertation.

You were selected as a possible participant in this study because you were nominated by the management of your company as a supervisor with more than five years supervisory experience.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. The information you provide will be your estimation of the importance to your job of each task from a list of tasks. Your estimation will be averaged with the other panel members, and this average rating is the information needed by the study. If you are chosen for the pilot study, you will need about one hour to go through the list of tasks. If you are chosen for the Delphi panel, there will be three rounds of rating tasks, each taking no more than 30 minutes. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

This survey is anonymous. If you are taking the web-based survey, we will not link your answers with your IP address. The useable data will be an average of all answers, so your specific response will be anonymous. If you do not have access to the Internet, we will use a hard copy survey. In that instance, do not write your name on the survey. The data you provide on the hard copy will be averaged with the other panel members. We cannot guarantee absolute anonymity over the Internet, but considering the nature of the data, a rating of importance of a task, there would be no risk to you even if someone wished to intercept your submission. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study. Individuals from the Institutional Review Board may inspect these records. Should the data be published, no individual information will be disclosed. All individualized data, to include hard copy, will be destroyed 90 days after the dissertation is accepted by the University.

Your participation in this study is voluntary. By completing and doing whatever you should do during the pilot study or with the each Delphi round's survey (e.g., completing a web-based survey or mailing the hard copy), you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer for any reason.

If you have any questions about this study, please contact:

Leonard Pederson, Assistant Professor, Jarvis Hall Technology Wing Room 268, University of Wisconsin – Stout, Menomonie, WI 5475; office 715-232-2338; cell 612-270-7021, pedersonle@uwstout.edu; OR

Dr. Gordon Minty, Professor, College of Technology Room TC 302B, Indiana State University, Terre Haute, IN 47809; office 812-237-3380; gminty@isugw.indstate.edu.

If you have any questions about your rights as a research subject or if you feel you've been placed at risk, you may contact the Indiana State University Institutional Review Board (IRB) by mail at Indiana State University, Office of Sponsored Programs, Terre Haute, IN, 47809, by phone at (812) 237-8217, or by e-mail at irb@indstate.edu.

APPENDIX C: STATUS EMAIL

Supervisors,

I am currently doing the pilot study on the initial questions. This is intended to insure that the questions are very clear in meaning so that when you evaluate them, you will not be confused. This process should be done by next week. Then I will upload the initial questions to the survey software, and then we will be off and running.

We are very close to doing the actual survey. I need to verify that my email addresses for you are correct, and that you have received this message. Please hit the reply button and send this email back to me as soon as you can.

Thank you

Len

APPENDIX D: FIRST ROUND EMAIL SURVEY

Subject Matter Expert,

We are finally starting the Delphi survey. Thank you for your patience to this point. This is the first round.

The purpose of this survey is for you to decide how important each task/responsibility is to your job as a supervisor. You are to decide whether that task/responsibility is of no importance, little importance, average importance, significant importance or critical importance. It is up to you to decide what those terms mean to you and your job, using the number scale (0, 1, 2, 3 and 4) as a guide. You will put your choices in the chart below. You can use any mark, either the number with the importance level or just an X, whatever you want. The important thing is to mark all of the tasks. They are in alphabetic order, so the order on the list has no meaning.

If there is a task or responsibility that is not on the list, you have the opportunity to add it at the end. I have left a few spaces at the bottom for you to do so if necessary. If you run out of space at the bottom, contact me.

DIRECTIONS:

1. Hit the REPLY button on the top. If you do not do this, you will not be able to put anything into the chart below.
2. In your opinion, decide the importance of each task/responsibility to your job as a supervisor.
3. Put a mark in the correct box (cell) indicating your decision.
4. Type in any missing tasks/responsibilities in the space at the bottom, AND GRADE THOSE ADDITIONS ALSO.
5. After you have marked all of the tasks, hit the SEND button.

IF YOU HAVE ANY TECHNICAL PROBLEMS WITH THIS SURVEY, CALL ME IMMEDIATELY (612-270-7021)

TASK/RESPONSIBILITY	0 = no import- ance	1 = little import- ance	2 = average import- ance	3 = signific ant import- ance	4 = critical import- ance
Assign equipment to jobs H31					
Assigning workers to jobs H09					
Assist in worker training H40					
Assist workers with tasks H11					
Attending planning meetings H19					
Attending review meetings H21					
Authorizing non-routine actions by workers H22					
Conduct team briefings H23					

Controlling operations costs H33					
Coordinating work of a team H12					
Dealing with immediate customer/client concerns H15					
Enforce cleanliness standards H25					
Enforce work rules and policies H05					
Explain work priorities H03					
Give verbal warnings H37					
Give written warnings H44					
Giving informal feedback on performance H26					
Handle immediate materials issues H32					
Help implement changes in work practices H14					
Hold formal performance reviews H34					
Implement efficiency improvements H16					
Keep management informed H13					
Keep workers and management informed H08					
Keep workers informed of goals and mission H30					
Maintain computer files and information H27					
Maintain personnel records H43					
Manage multiple teams H41					
Manage work schedule H07					
Managing a budget H36					
Meet with other supervisors H35					
Motivate workers to change or improve their performance K01					
Perform work tasks H04					
Plan a budget H42					
Provide cover for staff to take breaks H29					
Provide on the job technical training H10					
Provide praise when deserved H01					
Provide workers technical advice H06					
Recommending promotions H28					
Resolve conflicts among workers K13					
Resolve immediate equipment problems H24					
Resolve immediate problems with production space H39					
Resolve immediate staffing problems H18					
Resolve immediate work flow or process problems H17					
Scheduling workers to shifts and overtime H38					
Spot check production amounts H02					
Spot check production quality H20					

TASK/RESPONSIBILITY	0 = no importa nce	1 = little import ance	2 = average import ance	3 = signific ant import ance	4 = critical import ance

After I receive all of the panel members choices, I will average the marks. On the second round, you will receive this same chart with two more columns added between the task/responsibility column and the 0 = no importance column. The first new column will contain your grade (0-4) from the first round, and the second column will contain the panel average grade from the first round. On the second round, you will remark all of the tasks, but this time you will be able to compare what the panel as a whole decided and what you had decided the first time, and with that new information, make a second choice. Your second choice can be the same as your first, higher or lower. It is up to you to decided.

This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46

Again, thank you for participating in this study.

Len

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APPENDIX E: SECOND ROUND EMAIL SURVEY

Subject Matter Expert,

Thank you very much for responding to the first round. We are now into the second round of the Delphi survey. Usually it takes three rounds to come to a consensus, but it might go to the fourth round in unusual circumstances.

Again, like the first round, the purpose of this survey is for you to decide how important each task/responsibility is to your job as a supervisor. You are to decide whether that task/responsibility is of no importance (0), little importance (1), average importance (2), significant importance (3) or critical importance (4). It is up to you to decide what those terms mean to you and your job, using the number scale (0, 1, 2, 3 and 4) as a guide. You will put your choices in the chart below. You can use any mark, but an X would be best. The important thing is to mark **all** of the tasks. Three more have been added at the end from the first round. They are in alphabetic order except for the three added tasks at the bottom, so the order on the list has no meaning.

The most significant difference this round is you now have more information in making your response. I have given you your first response, and the average of all the other panel members responses. In your first round, you did not have any benchmark to compare your responses. This time you have two additional pieces of information to make a comparison, if you wish. With this additional information, you can lower your rating for that task, keep your rating the same, or raise the rating, at your pleasure. You are not required to change your first round response if you feel that still reflects how important you feel that task is to your job.

From the first round, three tasks have been added. If you feel you must add some tasks that you did not consider on the first round, please contact me.

DIRECTIONS:

1. Hit the REPLY button on the top. If you do not do this, you will not be able to put anything into the chart below.
2. In your opinion, decide the importance of each task/responsibility to your job as a supervisor.
3. Put a mark in the correct box (cell) indicating your decision.
4. Type in any missing tasks/responsibilities in the space at the bottom, AND GRADE THOSE ADDITIONS ALSO.
5. After you have marked all of the tasks, hit the SEND button.

IF YOU HAVE ANY TECHNICAL PROBLEMS WITH THIS SURVEY, CALL ME IMMEDIATELY (612-270-7021)

TASK/RESPONSIBILITY	Your Response	First Round					
	First Round	Panels Response	0 = no importance	1 = little importance	2 = average importance	3 = significant importance	4 = critical importance
Assign equipment to jobs H31	4	2.9					
Assigning workers to jobs H09	4	3.4					
Assist in worker training H40	2	2.6					
Assist workers with tasks H11	2	2.5					
Attending planning meetings H19	1	2.8					
Attending review meetings H21	2	2.8					
Authorizing non-routine actions by workers H22	4	2.4					
Conduct team briefings H23	4	2.9					
Controlling operations costs H33	4	3.1					
Coordinating work of a team H12	4	3.3					
Dealing with immediate customer/client concerns H15	4	2.8					
Enforce cleanliness standards H25	4	2.9					
Enforce work rules and policies H05	4	3.4					
Explain work priorities H03	4	3.3					
Give verbal warnings H37	4	3.1					

Give written warnings H44	4	3.1						
Giving informal feedback on performance H26	4	3.3						
Handle immediate materials issues H32	4	3.1						
Help implement changes in work practices H14	4	3.0						
Hold formal performance reviews H34	4	3.3						
Implement efficiency improvements H16	4	3.1						
Keep management informed H13	4	3.5						
Keep workers and management informed H08	4	3.6						
Keep workers informed of goals and mission H30	4	3.3						
Maintain computer files and information H27	3	2.7						
Maintain personnel records H43	4	2.6						
Manage multiple teams H41	4	2.8						
Manage work schedule H07	4	3.2						
Managing a budget H36	3	2.3						
Meet with other supervisors H35	4	3.3						
Motivate workers to change or improve their performance K01	4	3.4						
Perform work tasks H04	4	3.1						
Plan a budget H42	1	1.8						
Provide cover for staff to take breaks H29	4	2.0						
Provide on the job technical training H10	4	2.9						

Provide praise when deserved H01	4	3.5					
Provide workers technical advice H06	4	3.2					
Recommending promotions H28	4	2.7					
Resolve conflicts among workers K13	4	3.3					
Resolve immediate equipment problems H24	4	3.6					
Resolve immediate problems with production space H39	4	2.8					
Resolve immediate staffing problems H18	4	3.3					
Resolve immediate work flow or process problems H17	4	3.3					
Scheduling workers to shifts and overtime H38	4	3.1					
Spot check production amounts H02	4	2.9					
Spot check production quality H20	4	3.1					
Attend safety meetings, safety audits, safety training of people A01	Ad ded	3.0					
Do hourly pay roll A02	Ad ded	4.0					
Keeping track of vacation and personal time A03	Ad ded	4.0					
TASK/RESPONSIBILITY	Your Response First Round	Panels Response First Round					
			0 = no importance				
			1 = little importance				
			2 = average importance				
			3 = significant importance				
			4 = critical importance				

This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46

Again, thank you for participating in this study.

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APPENDIX F: THIRD ROUND EMAIL SURVEY

Subject Matter Expert,

Thank you very much for responding to the second round. We are now into the third round of the Delphi survey. Usually it takes three rounds to come to a consensus. If the third round reaches consensus, there will be one more round to estimate the number of hours spend per week on each task. That will take a different format, and I will explain that in detail when it comes about.

Again, like the first and second rounds, the purpose of this survey is for you to decide how important each task/responsibility is to your job as a supervisor. You are to decide whether that task/responsibility is of no importance (0), little importance (1), average importance (2), significant importance (3) or critical importance (4). It is up to you to decide what those terms mean to you and your job, using the number scale (0, 1, 2, 3 and 4) as a guide. You will put your choices in the chart below. You can use any mark, but an X would be best. The important thing is to mark **all** of the tasks. They are in alphabetic order except for the three added tasks at the bottom, so the order on the list has no meaning.

The most significant difference this round is you now have more information in making your response. I have given you your second round response, and the average of all the other panel members responses. This round you have your second round response and the panels average response to make a comparison, if you wish. With this additional information, you can lower your rating for that task, keep your rating the same, or raise the rating, at your pleasure. You are not required to change your second round response if you feel that still reflects how important you feel that task is to your job.

DIRECTIONS:

1. Hit the REPLY button on the top. If you do not do this, you will not be able to put anything into the chart below.
2. In your opinion, decide the importance of each task/responsibility to your job as a supervisor.
3. Put a mark in the correct box (cell) indicating your decision.
4. Type in any missing tasks/responsibilities in the space at the bottom, AND GRADE THOSE ADDITIONS ALSO.
5. After you have marked all of the tasks, hit the SEND button.

IF YOU HAVE ANY TECHNICAL PROBLEMS WITH THIS SURVEY, CALL ME IMMEDIATELY (612-270-7021)

TASK/RESPONSIBILITY	Your Response Second Round	Panels Response Second Round	0 = no	1 = little	2 = average	3 = significant	4 = critical
			importance	importance	importance	importance	importance
Assign equipment to jobs H31	3	2.9					
Assigning workers to jobs H09	3	3.3					

Assist in worker training H40	3	2.8							
Assist workers with tasks H11	3	2.5							
Attending planning meetings H19	3	3.0							
Attending review meetings H21	3	2.8							
Authorizing non-routine actions by workers H22	2	2.6							
Conduct team briefings H23	3	2.9							
Controlling operations costs H33	4	3.1							
Coordinating work of a team H12	3	3.3							
Dealing with immediate customer/client concerns H15	4	2.9							
Enforce cleanliness standards H25	3	2.9							
Enforce work rules and policies H05	3	3.4							
Explain work priorities H03	3	3.4							
Give verbal warnings H37	3	3.1							
Give written warnings H44	3	3.2							
Giving informal feedback on performance H26	3	3.3							
Handle immediate materials issues H32	4	3.3							
Help implement changes in work practices H14	3	3.2							
Hold formal performance reviews H34	3	3.3							
Implement efficiency improvements H16	3	3.3							
Keep management informed H13	3	3.6							
Keep workers and management informed H08	3	3.7							
Keep workers informed of goals and mission H30	3	3.5							
Maintain computer files and information H27	3	2.9							
Maintain personnel records H43	3	2.7							
Manage multiple teams H41	3	2.8							
Manage work schedule H07	3	3.3							
Managing a budget H36	3	2.4							
Meet with other supervisors H35	3	3.4							
Motivate workers to change or improve their performance K01	3	3.4							
Perform work tasks H04	3	3.1							
Plan a budget H42	3	1.9							
Provide cover for staff to take breaks H29	2	1.9							
Provide on the job technical training H10	3	2.9							
Provide praise when deserved H01	3	3.7							
Provide workers technical advice H06	3	3.2							
Recommending promotions H28	3	2.8							
Resolve conflicts among workers K13	3	3.3							
Resolve immediate equipment problems H24	4	3.7							
Resolve immediate problems with production space H39	3	2.7							
Resolve immediate staffing problems H18	3	3.4							

Resolve immediate work flow or process problems H17	3	3.3					
Scheduling workers to shifts and overtime H38	2	3.2					
Spot check production amounts H02	3	3.1					
Spot check production quality H20	3	3.1					
Attend safety meetings, safety audits, safety training of people A01	2	2.8					
Do hourly pay roll A02	2	2.7					
Keeping track of vacation and personal time A03	2	2.7					
TASK/RESPONSIBILITY	Your Response						
	Second Round						
	Panels Response						
	Second Round						
	0 = no importance						
	1 = little importance						
	2 = average importance						
	3 = significant importance						
	4 = critical importance						

This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46

Again, thank you for participating in this study.

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APPENDIX G: FOURTH ROUND EMAIL SURVEY

Subject Matter Expert,

CONGRATULATIONS – WE HAVE CONSENSUS ON THE IMPORTANCE OF THE TASKS AND RESPONSIBILITIES!

Thank you very much for responding to the third round of the Delphi survey. We have reached consensus on the importance of the tasks and responsibilities. We have one more round to go and we are done.

We are now into what is called the triangulation round of the Delphi survey. This round will be used to estimate the number of hours spend per week on each task. This is important to make sure that we have captured all of the important tasks and have not left anything out. If we have discussed all of the most important tasks that a supervisor does, then it stands to reason that most of the hours spent in the average work week would be on doing those tasks.

Unlike the previous three rounds, the purpose of this round is for you to decide how many hours per week ON AVERAGE you spend doing each of the tasks and responsibilities in your job as a supervisor. The tasks are sorted in order of importance as decided by you the panel in the last round. The first task on top had the highest average score and the last task in the list had the lowest average score.

Put after each task statement your estimation of the number of hours per week you spend on that task. It is not important that you be exact. What we need is the average total number of hours and not the average hours for each individual task, so if some of the time slides between tasks, it is not important. The last statement is a block to put in your estimation of the combined time spend on all other tasks not on the list. We also need your estimation of how many hours per week you work in an average week. This way we can convert all of the average task times into percentage of time per week.

If the total hours do not add up to the estimated hours per week that you work, do not be concerned. I am going to convert everything to percentages right away, and it will all work out. Do not spend time trying to make sure all of the individual task hours match the number of hours per week that you work. It will only frustrate you, and is not important for what I am looking for in this round.

REMEMBER – I AM THE ONLY PERSON WHO WILL SEE THE DATA, AND AS SOON AS I CONVERT EVERYTHING INTO PERCENTAGES, YOUR INDIVIDUAL TIMES WILL BE DELETED. DO NOT CONCERN YOURSELF WITH HOW YOU ANSWER EACH TASK OR THE TOTAL TIME WORKED PER WEEK. THEY WILL BE HELD IN STRICTEST CONFIDENCE. ALL I NEED IS YOUR BEST AND HONEST ESTIMATES OF THE TIMES.

DIRECTIONS:

1. Hit the REPLY button on the top. If you do not do this, you will not be able to put anything into the chart below.
2. Put the AVERAGE total time worked each week in the space provided.

3. In your opinion, decide how much time each week you spend on each task/responsibility in your job as a supervisor.
4. Put the number in the correct box (cell) indicating your decision on how much time.
5. After you have marked all of the tasks, hit the SEND button.

IF YOU HAVE ANY TECHNICAL PROBLEMS WITH THIS SURVEY, CALL ME IMMEDIATELY (612-270-7021)

PLEASE PUT THE AVERAGE NUMBER OF HOURS YOU WORK PER WEEK HERE -> ____

TASK/RESPONSIBILITY	Final Response of Panel	Hours Spent per Week on Task
Keep management informed H13	3.7	
Keep workers and management informed H08	3.7	
Resolve immediate equipment problems H24	3.7	
Provide praise when deserved H01	3.6	
Keep workers informed of goals and mission H30	3.5	
Meet with other supervisors H35	3.5	
Resolve conflicts among workers K13	3.5	
Handle immediate materials issues H32	3.4	
Implement efficiency improvements H16	3.4	
Motivate workers to change or improve their performance K01	3.4	
Resolve immediate work flow or process problems H17	3.4	
Enforce work rules and policies H05	3.3	
Explain work priorities H03	3.3	
Hold formal performance reviews H34	3.3	
Resolve immediate staffing problems H18	3.3	
Assigning workers to jobs H09	3.3	
Coordinating work of a team H12	3.3	
Giving informal feedback on performance H26	3.3	
Help implement changes in work practices H14	3.3	
Provide workers technical advice H06	3.3	
Manage work schedule H07	3.2	
Spot check production quality H20	3.2	
Give written warnings H44	3.1	
Scheduling workers to shifts and overtime H38	3.1	
Spot check production amounts H02	3.1	
Assign equipment to jobs H31	3.1	

Conduct team briefings H23	3.1		
Controlling operations costs H33	3.1		
Give verbal warnings H37	3.1		
Attending planning meetings H19	2.9		
Perform work tasks H04	2.9		
Provide on the job technical training H10	2.9		
Maintain computer files and information H27	2.9		
Dealing with immediate customer/client concerns H15	2.8		
Enforce cleanliness standards H25	2.8		
Manage multiple teams H41	2.8		
Recommending promotions H28	2.8		
Resolve immediate problems with production space H39	2.8		
Attend safety meetings, safety audits, safety training of people A01	2.8		
Assist in worker training H40	2.7		
Attending review meetings H21	2.7		
Maintain personnel records H43	2.7		
Do hourly pay roll A02	2.7		
Keeping track of vacation and personal time	2.7		
Authorizing non-routine actions by workers H22	2.5		
Managing a budget H36	2.5		
Assist workers with tasks H11	2.4		
Plan a budget H42	1.9		
Provide cover for staff to take breaks H29	1.9		
Other Miscellaneous Tasks Performed During the Week			
TASK/RESPONSIBILITY	Final Response of Panel		Hours Spent per Week on Task

This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46

Again, thank you for participating in this study.

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