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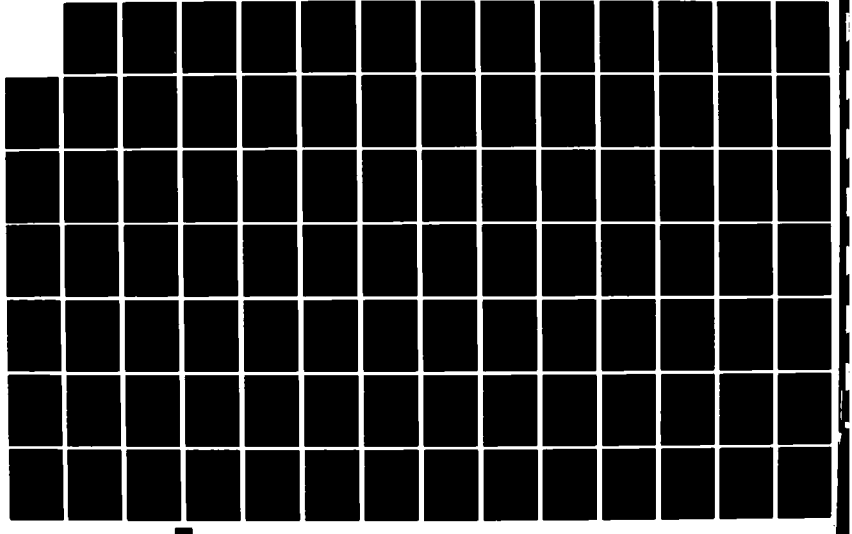

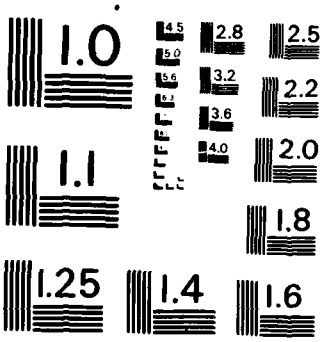

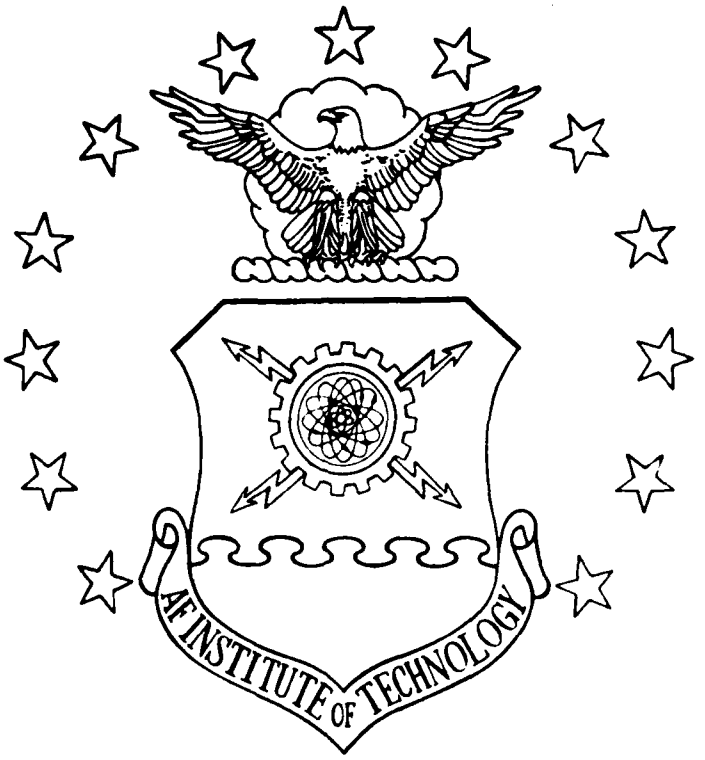

AN ANALYSIS OF THE IMPACT OF THE WORK INFORMATION MANAGEMENT SYSTEM (WIMS) ON CIVIL ENGINEERING OPERATIONS MANAGERS' JOB FACTORS

THESIS

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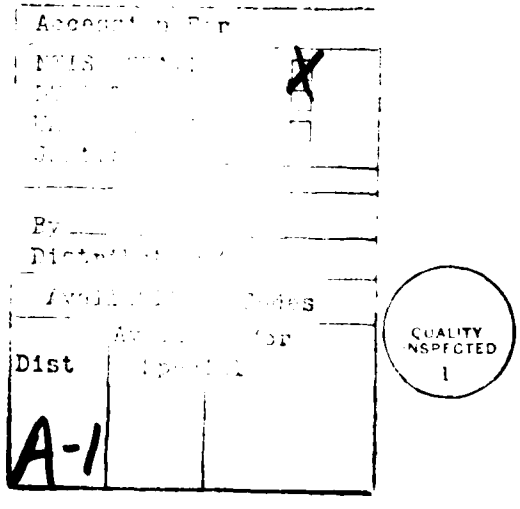

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THESIS

Presented to the Faculty of the School of Systems and
Logistics of the Air Force Institute of Technology
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Donovan P. Colman

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Abstract

In this research, the impact of the newly implemented Work Information Management System (WIMS) on civil engineering operations managers' was examined. The main purpose was to determine if WIMS impacted managers' perceptions of various job factors including task variety, task identity, task significance, autonomy, feedback, job pressure, difficulty/skill level, job satisfaction, amount of dealing with others, centralization, formalization, and organizational politics.

Managers, ranging from the Chief of Operations to shop foremen, were surveyed. Data were collected from five organizations that had implemented WIMS, the test group, and from five organizations that had not implemented WIMS, the control group. The test group's responses were compared against the control group's responses to determine the impact of WIMS. The results indicated that the test group perceived dealing with others a more essential part of their jobs than the control group. When subdivided into levels of managers, the results indicated test group senior mangers perceived their jobs to be more significant and test group operational managers perceived their jobs to require a higher skill level than the control group's corresponding

level of managers. Responses to open-ended questions indicated the overall perception of WIMS is positive. WIMS is greatly aiding the handling of work documents, and in turn, helping managers improve their effectiveness.

AN ANALYSIS OF THE IMPACT OF THE WORK INFORMATION MANAGEMENT SYSTEM (WIMS) ON CIVIL ENGINEERING OPERATIONS MANAGERS' JOB FACTORS

I. Overview

Introduction

This chapter provides an overveiw of the research project. The chapter begins with a background of an Air Force civil engineering (CE) management information system implementation. An information system, known as the Work Information Management System (WIMS), has been implemented at a few civil engineering organizations within the operations branch. The structure and the functions of the operations branch are described. Tasks necessary to productively use the computer based information systems are proposed. The productive use of this new computer system must be obtained to provide a return on the investment. The research effort is then justified in order to assist the attainment of productive use of the computer system. The specific problem was to determine the extent information technology will impact job dynamics, and whether this impact is an asset or a detriment to mission accomplishment. From this specific problem, research objectives and research questions were developed. The scope and limitations of this research conclude the chapter.

Background

The current United States Air Force's Engineering and Services Strategic Plan includes a goal to implement a Civil Engineering Work Information Management System (WIMS), a specialized computer based information system, in all civil engineering organizations by 1987 (37:8). As a result, Air Force civil engineering managers will soon be coping with and adjusting to the presence of this new technology. Hammil (9:12) indicates "Twenty-eight [WIMS] systems are operational, including a full system at Tinker [AFB] (all branches, 71 terminals)," and "Portions of WIMS are working well at Wright-Patterson AFB, McClellan AFB, Edwards AFB and the Air Force Academy". The acquisition of complete WIMS systems for all civil engineering organizations is underway, and all systems should be installed by 1988. At some bases, a portion of the WIMS has been installed only in the operations branch (9:12).

This research will focus on the impact of information technology on the users within the civil engineering operations branch. These users will be personnel who directly access the computer or use information retrieved for them by other individuals.

The Air Force civil engineering organization's mission "is to provide the necessary assets and skilled personnel to prepare and sustain global installations as stationary

platforms for the projection of areospace power in peace and war" (4:2). To perform this mission, the organization has distributed functions to different branches. The operations branch is responsibile for the functions of receiving and processing requests for work, planning and scheduling work, and operations, maintenance, repair, and minor construction of Air Force facilities (4:19). To perform these functions, the operations branch is subdivided into separate sections, all of which report to the Chief of Operations. These sections are the Resourcess and Requirements, Pavements and Grounds, Structures, Mechanical, Electrical, Electric Power Production, Systems Management, Hospital Maintenance, and Family Housing Maintenance (4:19).

Organizational structure may vary between one civil engineering organization to another. Redmiles (24:10) indicates a major reorganization was approved for the operations branch on 18 May 1984. The implementation of this reorganization was completed by 1 October 1984. The major changes deal with providing options for the structure of the Resources and Requirements section, options for the Deputy Chief of Operation's responsibilities, and options for establishing a Quality Assistance function and a Sanitation Superintendent. The options depend upon the size of the organization and the responsibilities of the organization at each respective base. Due to these different options, major command directives, and different

mission responsibilities, the organizational structure may vary, but the basic structure and tasks should be similar at all bases. Considering potential differences in organizational structure and responsibilities, the general description that follows will be limited to the basic organizational structure.

The Resources and Requirements (R & R) section "identifies, receives, processes and plans work to be accomplished by the base civil engineering organization" (4:15). The R & R section is also responsible for the control of materials to support civil engineering activities (4:15). Through the customer service and service call functions, the R & R section is the single point of contact for civil engineering customers. The R & R section also "programs and manages in-service work through the in-service work plan (IWP) and scheduling (4:15). The R & R section also provides planning functions for the branch through the planning section. See appendix A for definitions of USAF civil engineering and other technical terms.

The other sections in the operations branch actually perform the operations, maintenance, repair, and services provided by the civil engineering organization. These sections include Pavements and Grounds, Structures, Mechanical, Electrical, Electrical Power Production, Sanitation, Hospital Maintenance, and Family Housing Maintenance (4:19). See Appendix H, civil engineering

organizational chart. Each section is comprised of at least one shop and may have five or six shops depending on the size of the organization and base's mission. Each section is managed by a superintendent, and each shop is run by a foreman. The work normally requires coordinated efforts of several shops.

WIMS will be used for work process tracking and office automation (34:494). There are three types of tasks that are seen to be necessary for the productive use of WIMS. First is the data entry function in which work requests are entered, the status of the work is updated as it progresses, the status of material (supplies and equipment) necessary to accomplish the work is updated, and the work plan is updated. The second task is the information retrieval from data bases in developing planning packages, work schedules, and supply availability. The third task is the analysis of data to make management decisions, establish policy, and perform control functions.

> Air Force Engineering and Services is pursuing new approaches to automation. The future outlook includes an integration of several types of current technology. Future applications will stress electronic office concepts that are user friendly and flexible. Instead of stifling the initiative and creativity of people in the field, the flexibility to investigate automation, . . . will be stressed (34:494).

The systems already in operation are determining the uses and requirements for implementation into the other

bases, and an experimental approach seems to be encouraged. Because of the stress for flexibility and creativity, the actual use of the WIMS may differ from organization to organization.

Justification

Wims was proposed as "a powerful tool to assist personnel in the performance of their functions and to assist managers to assess operational data" (41:3). A byproduct of this 'powerful tool' is increased productivity "through better resource allocation and effectiveness measurement" (41:3). An analysis of the impact information technology has on job factors will identify perceptions, reactions, and outcomes of the implementation of WIMS. These perceptions, reactions, and outcomes may provide indications of counterproductive factors as well as beneficial factors. If managers do not use WIMS productively, the return on the investment of expensive computer hardware and software may not be realized; but worse yet, mission support may be degraded. Consequently, it is imperative to identify those factors that can enhance future implementation and use of WIMS.

Problem Statement

The implementation of WIMS is expected to bring change to the BCE organization which may occur at different organizational levels and within specific situational task

factors. The specific problem is to determine what task factors will be impacted and whether this impact is an asset or a detriment to the organization.

Research Objectives

In order to answer the specific problem, two research objectives must be met. The first objective was to determine the impact WIMS had on the managers of the organization. These managers included the Chief of Operations, the Deputy Chief of Operations, the Chief of Resources and Requirements (or Chief of Logistics and Chief of Requirements if the organization has reorganized), Chief of Production Control and Chief of Planning. The second objective was to determine the impact of WIMS on the middle and operational, first line, managers. These individuals were the superintendents of the operational sections and the foremen of each particular shop respectively.

Research Questions

Several questions identify some specific areas for investigation leading to the achievement of the research objectives. They are listed as follows:

1. What impact will WIMS have on factors such as skill variety, task identity, task significance, autonomy, feedback, difficulty/skill level, and job satisfaction?
2. What impact will WIMS have on organizational

factors such as amount of dealing with others, centralization, organizational politics, job pressure and formalization?

3. Will the individual factors of job position, experience, education, and age be significant moderating variables?
4. What are the positive and negative impacts of WIMS?
5. What factors cause the most significant positive or negative impact?
6. What effect will WIMS have on the managerial performance?

Scope and Limitations

This research effort was limited to an analysis of the impact of information technology on job dynamics in base civil engineering operations branches. The impact of automation on other branches in the organization was not examined.

A limitation of this analysis was the differences between organizations. These differences include organizational size, location, support of different missions, and length of time WIMS has been implemented. Another limitation was the different portions of the total system that were operating in different organizations. An in-depth analysis of the software each organization uses was

not attempted because of time limitations of the research project.

This study was a cross-sectional study and consequently only analyzed data collected at one point in time. Causal inferences are difficult to make without longitudinal data and control of extraneous variables. The data collected in this project were the perceptions of the operations managers which is only one indicator of the impact of WIMS. However, it is an important area of study because productivity results from improved performance. To get improved performance, WIMS will have to impact managers perceptions in a positive manner.

II. Literature Review

Introduction

This chapter presents a review of literature discussing the impact of implementing information technology, in an organization. The review will begin with a discussion of problems that can result from implementation. The next section will review the impact of information technology on the various characteristics of jobs such as skill variety, task identity, task significance, autonomy, feedback, task difficulty/skill level, job satisfaction, job pressure, and amount of dealing with others. Impacts to organizational factors including organizational structure, organizational politics, and level of system use will be reviewed. The final section summarizes the literature review.

Management Information System Implementation Problems

Introducing a management information system will bring change to the organization. Wildavsky goes so far to suggest a MIS will counter the very reason an organization exists. He suggests an organization filters, compresses, or reduces data to manageable forms as it passes it up the hierarchy (39:29-30). The organizational structure is designed to reduce information while an MIS is designed to increase and create information. Wildavsky infers then that the organization and the MIS will work against each other and create conflicts and problems (39:29-30).

King proposed the concept that MIS could become another

"management 'innovation' such as PERT network techniques, linear programming, MBO" and other techniques which have experienced periods of high popularity and then rapidly declining interest (11:10). The declining interest begins when the "fad" or "innovation" does not produce expected results. King proposes some causes for the higher than achievable expectations. One of the causes is venders tend to "oversell" their systems. Another cause is the organization's reason for implementing a system is to appear modern and keep up with technology rather than to focus the use of the system towards achieving the organization's primary objectives and responsibilities. Due to one or both of these causes, the organization develops goals for the system it cannot attain (11:10-11).

Implementing an MIS in an organization will require change and may lead to some specific problems. Wildavsky contends that information for information's sake may cause effort to be spent on obtaining information that may be detrimental and counterproductive (39:36). King (11:11) presents specific problems or what he calls "pitfalls" of MIS implementation. One "pitfall" is "'misdirection' of the systems in the sense that they are not truly focused toward helping the organization achieve its objectives and implement its strategies, but rather on goals reflecting the desire to have the image of using the most modern and sophisticated 'tools'". Another "pitfall" is the system and information

processing techniques can be designed and installed at a sophistication level that most users were not capable of using. Early claims of system flexibility created "unrealistic expectations" in the users. Conflict began between users and developers during implementation and when systems changes were made with little or no input from the users (11:11). Wildavsky also identifies "bootlegging", "bypassing", and "paralleling" as problems created by an organization attempting to cope with new information technology. "Bootlegging" is the changing of information or unauthorized alterations to obtain data. "Bypassing" is going to someone you know who has the information because the system is too much trouble to use. Finally, "paralleling" an old system with a new system may lead to duplication (39:30). These are only a few of the potential problems of implementing a MIS into an organization.

Robey and Zeller's (31:70-75) research considered the success and failure of MISs in two similar departments in the same organization. The research was looking for factors for failure or success due to behavioral factors and not due to the system hardware or software. They concluded the following:

1. At the individual level, certain attitudes were found to be more important than others.

2. The organizational factors of complexity, formality, and centralization also affect implementation.

3. Lack of involvement by system developers is not sufficient to ensure failure if the vital function of

explaining the system to ultimate users is assumed by some other knowledgeable person in the group.

4. Strong management support is instrumental to system adoption.

User concerns of an MIS's impact on performance are critical. This strongly suggests success of an MIS is based on individual and organizational factors and not solely on the hardware and software being installed. Robey states "MIS can and does fail where user psychological reactions and organizational factors are ignored" (28:527).

Individual Job Characteristics

This section will discuss the impact or effect information technology has on the characteristics of one's job. These factors include skill variety, task identity, task significance, autonomy, feedback, task dificulty/skill level, job satisfaction, and job pressure. These factors characterize the basic components of an individual's work. These factors are controlled to a certain extent by outside or external forces but the job factors themselves are what the individual feels or perceives.

Technological advances have altered the way work has been accomplished in almost all realms. Agriculture has changed dramatically with the introduction of the tractor. Small shops of individuals producing a complete item were replaced by factories where individuals only performed one or two tasks as a part of the overall production of an item during the Industrial Revolution. Consistent with this historical

trend, information technology will alter the way work is done in organizations that are using this technology (15:59, 38:41). The primary users of information, the by-product of information technology, are typically managers who use the information to make decisions, take corrective action, and plan for the future. So their jobs, or more specifically their tasks, and the way they feel about their jobs should be affected the most by information technology. The intent, or design, of the information technology is to provide information so the manager can perform his functions quicker and arrive at more optimal solutions. Leavitt and Whisler (38:41) predicted in 1958 that information technology would have the most significant impact on "middle and top management." They also predicted the tasks of middle management would become more formalized with the manager following rules for most operating decisions. They also predicted top management would assume a greater role in the "innovating, planning, and other 'creative' functions" (38:42). Leavitt and Whisler felt certain classes of middle management would require less autonomy and skill levels causing their positions to become degraded in status and compensation with other classes of middle managers moving in the opposite direction. In other words, the middle management level will shrink with the current positions going up or down in the current organizational structure. The "line" separating top and middle management will become very

distinct and be much harder to cross due to the information technology.

Robey (27:391) presents Anshen's counter argument that the computer will enhance a managers job by relieving the manager of tedious routine providing the manager more time for "creativity and unstructured problem solving" ultimatly leading to greater job satisfaction. Robey goes on to assert that jobs with challenge and achievement opportunities are more motivating than jobs without them. Robey cites research that found a relationship between tasks with greater variety, autonomy, identity, and feedback have greater 'motivating potential.' He then presents the expectation that managers will be less motivated and satisfied when information systems reduce task scope and conversly motivation and satisfaction will increase if the manager's task scope increases.

Research on manager's use of computers has been positive. Bickson and Gutek also found management not resistant to using this new technology, but either using it or expecting to use it in the near future (1:328). Robey feels middle managers have embraced the computer becuase it helps managers performance. They treat the computer as a tool to help them do their job (27:394).

The discussion of internal factors will be for the most part guided by Hackman and Oldham's task redesign research. Hackman and Oldham (8:250) examined the factors that motivate individuals to "improve simultaneously the productivity and the quality of the work experience." They look at this issue

through the concepts of work redesign as a means of accomplishing improved productivity and work quality. They developed their Job Characteristics Model by evaluating the theories available and the measurable features to develop a model that could be be measured and examined empirically to determine what factors or features of a job will lead to beneficial or positive outcomes (8:251). The motivational theories Hackman and Oldham examined in coming up with their model included Herzberg's two factor theory, Festinger's activation theory, and socio-technical systems theory (8:251-255).

The Job Characteristics Model. The model is "at the most general level, five 'core' job dimensions are seen as prompting three psychological states which, in turn lead to a number of beneficial personal and work outcomes" (8:255). The three psychological states are "experienced meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the results of the work activities" (8:255). The model is based on the concept that an individual will be positively reinforced and in turn motivated when all three psychological states are experienced. This condition exists when the individual "learns (knowledge of results)" of the outcome of a task personally accomplished, "(experienced responsibility," that he/she "cares about (experienced meaningfulness)" (8:256). So, as long as the three psychological states are present and

the individual continues to perceive the internal rewards of value, a "self perpetuating cycle of positive work motivation" will exist (8:256). The three psychological states are further defined as follows:

> Experienced Meaningfulness of the Work. The degree to which the individual experiences the job as one which is meaningful, valuable, and worthwhile;
> Experienced Responsibility for Work Outcomes. The degree to which the individual feels personally accountable and responsible for the work he or she does;
> Knowledge of Results. The degree to which the individual knows and understands, on a continuous basis, how effectively he or she is performing the job (8:256-257).

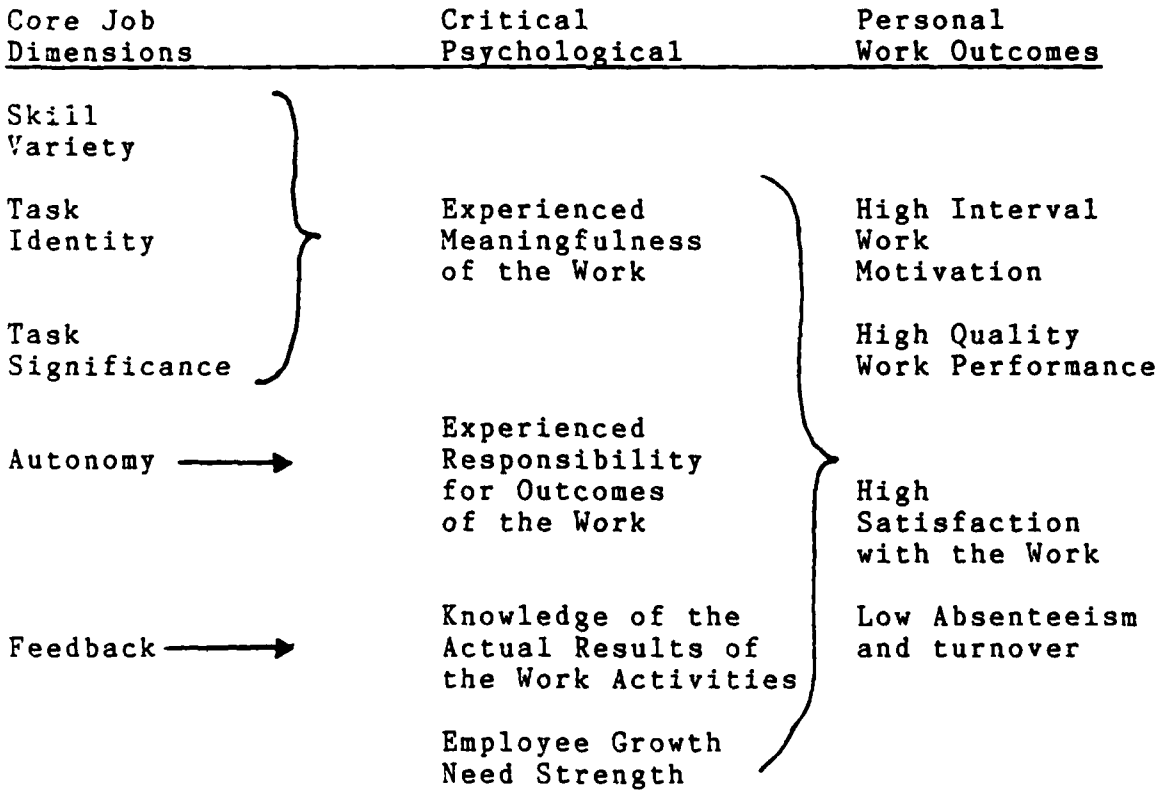


Figure 1. The Job Charactertistic Model of Work Motivation (8:256).

These psychological states are related to both core

dimensions and outcomes.

The core dimensions contribute to the different psychological states. Skill variety, task identity, and task significance combined contribute to the state of experienced meaningfulness. The psychological state of experienced responsibility is predicted through the individual's autonomy. Feedback determines the psychological state of knowledge of results. A discussion of each of these factors as well as task difficulty/skill level, job satisfaction, and job pressure will follow.

Skill Variety. "Skill Variety. The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person" (8:257). Challenging tasks are perceived as meaningful by individuals (8:257). Research on the impact of information technology on skill variety has suggested the increase or decrease in skill variety depends upon the particular job situation. Robey's research indicated use of information systems caused greater routine and standardization in some situations which was considered a positive change (27:393). Bickson and Gutek's research of the impact of information systems or computers on white collar workers found variety in work a significant predictor of the level of use (1:327). Croft and Lefkowitz contend managers have more unstructured tasks than clerical workers (3:199). With more unstructured tasks, the manager's use of

the computer should lead to a greater variety of tasks while clerical workers will have less variety of skills needed on the job.

Task Identity. "Task Identity. The degree to which the job requires completion of a 'whole' and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome" (8:257). Mowday and Spencer define "high scope jobs" as jobs high in task identity, skill variety, autonomy, task significance, and feedback (18:634). They predicted jobs with high scope would report higher job performance, satisfaction, and other beneficial features (18:634). A change in task identity by information technology could indicate the potential impact on performance. Thus, if computer users' task identity increases, this could be an indication that computer technology will increase performance.

Information systems have the ability to quickly perform tedious, previously lengthy, activities for many by-products of the information system. Managers will be able to concentrate their efforts on their primary tasks and increase their perception of task identity (35:45).

Task Significance. "Task Significance. The degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment" (8:257). Work that is perceived to have an impact or significant effect on other peoples lives and conditions will increase the meaningfulness of a job.

Kling (12:76) found increased task significance attributed to use of the computer. This finding was based on research on the impact of computers on white collar workers in 42 municipal governments.

Managers experiencing greater task significance may be attributed to the information system quickly providing reliable information increasing decision making effectiveness. The system also performs many mundane time consuming tasks freeing the manager for what he perceives more visable and significant functions (35:44).

Autonomy. "Autonomy. The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling work and in determining the procedures to be used in carrying it out" (8:258). Hackman and Oldham contended that if an employee has more to say in how the job is accomplished the individual will or should also feel more responsible for the outcomes (8:257-258). Robey suggests in some instances autonomy for individual to use new ideas and methods may increase as a result of information technology while at the same time in other areas of the job increase routine and standardization may increase beauracracy and thus decrease autonomy in that area.

Feedback. "Feedback. The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance" (8:258). Robey also

contends that feedback on decisions is an intrinsicly satisfying or enriching aspect of a job (27:392). Lee, in an early research effort, indicated computer systems increased feedback. This was a positive influence on performance and satisfaction (14:77). Robey's research of system users found a majority (55 out of 81) of the users reported increased feedback of which 54 felt this change was an improvement. Of the remaining 26 respondents, only one felt computers created a negative change, and 25 reported no change in feedback due to computers (27:392). Ive's and Chervany's research on alternate setting and technology levels found feedback increasing as the information system technology sophistication increased (10:44).

Task Difficulty/Skill Level. Another factor thought to be significant in terms of an individual's perceptions of a job is the difficulty in performing the task or the level of skill and experience required to perform the job. Robey separated several factors in a research project and found degree of complexity was an enriching or intrinsically satisfying aspect of the job (27:392). Robey states empirical studies have found the introduction of information systems has increased task scope and also contradictorily decreased task scope (28:536, 27:394). This suggests that task difficulty/skill level's relationship to information technology is not a direct one but driven by other moderating factors. Craft and Lefkowitz feel information technology, used sophisticatedly, on higher level tasks would not

necessarily change task descriptions in a job but the paths between portions of the tasks would differ as would the tools used to perform the tasks (3:198). This suggests the task difficulty/skill level will not increase due to information technology.

Job Satisfaction. An individual's satisfaction with his job was also felt to be an important consideration when examining the employees perceptions of his job. The research on job satisfaction, as with most behavioral issues, is not conclusive as whether job satisfaction is related to performance. Lucas found a reduction in job satisfaction after the implementation of a information system (16:75). Bikson and Gutek found an organizational orientation towards change significantly predicts both the level of system use and satisfaction with this use (1:327-328). As presented by Robey, Schewe found no relationship between satisfaction with the use of the system and user behavior (28:529). This suggests satisfaction is related to performance in some organization situations. While on the other hand, this also suggests the relationship between satisfaction and information technology may be related but only as a part of other relationships.

Job Pressure. The factors of work load, work pace, and variations in the pace were load factors (27:392). High degrees of load factors might relate to job pressure. Kling, in research of the impact of computer use on white

collar jobs, found an increase in job pressure due to computer use (12:76). Rockert and Crescenzi feel information technology will reduce the time to retrieve and manipulate information and in turn increase the amount of work that can be accomplished suggesting increased job pressure. Turner's (36:1216) results found user uncertainty went up with computer use. Users were able to perform more tasks (i.e., serve more clients) which created a greater degree of uncertainty and emotional drain. This increased interaction seemed to be a reason for the increasing uncertainty not the inadequacies of the computer system. This suggests information technology will increase job pressure indirectly if not directly in some situations.

Motivating Potential Score (MPS). Hackman and Oldham present an "overall 'motivating potential' of a job" (8:258). This motivating potential is based on the original premises of the model that a job's motivation potential should be highest when all three psychological states are present in the right degree. The job should register high in the measurable core dimensions that make up the three states. They call this the Motivating Potential Score which is the degree all of the three states or conditions are met. The MPS is computed:

$$MPS = \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Feedback}$$

A near zero score on either autonomy or feedback would dramatically lower the motivating potential while a low score

or even a zero score in variety, significance, or identity would also lower the motivating potential but not near the same degree (8:258). Hackman and Oldham stress this model is only a discussion of the job itself and does not discuss the individuality of the employee. They felt the employees' growth needs are a major player in predicting how the outcome of the behavior will be. Since a person's growth need strength is part of the individual's personality and probably cannot be changed without long term efforts and an investigation of the individual's situation, these factors were not discussed or pursued. The MPS from Hackman and Oldham's results "relates more strongly to the outcomes than do any of its component job dimensions" (8:262)

Hackman and Oldham's results provided "strong support" for the Job Characteristic's Model, but they did have a few areas they felt need further explanation. Some of these were hypothesised relationships they felt did not have support in the data and they proposed reasons such as the measuring device and individual differences. Their results found feedback to have less of a relationship than the other factors in the model and they suggest this may be due to the fact that their measurement only measured feedback from the job itself and not from peers and supervisors. They also found these variables to be interrelated to some extent (8:273).

The model was thought, by the author, to be a good

framework for measuring the extent a job changed due to information technology. Hackman and Oldham suggest

> the model can serve as a framwork for assessing and interpreting measurements collected to evaluate the effects of changes that have been carried out (e.g., to determine which job dimensions did and did not change, to assess the impact of the changes on the affective and motivational responses of employees (8:276).

They also mention the model does not consider interpersonal, technical, or situational moderators of how people react to their work (8:277). Because the model does not discuss all of the factors that potentially may be impacted or changed due to the implementation of information technology, three other factors were discussed. The next section will present some organizational factors that may be impacted by information technology.

Organizational Factors

This section presents a discussion of factors due to forces or causes from outside the job itself. These factors are amount of dealing with others, centralization, organizational politics, formalization, and level of sophistication. There has been much discussion of the impact on these factors. The empirical evidence is usually conflicting, not strongly supporting one theory or another. Robey feels the research on MIS impact has just begun and what empirical research is available is also clouded with much speculation that is not based on research (25:679). The impact of information technology on the organization is or

may be related to many of the infinite differences between organizations and situations within each organization (23:241-258). A discussion of these factors is presented.

Organizational Structure. Pfeffer and Leblebici present the concept that information technology impacts organizational structure (23:241-258). Robey (25:686) presents the counter argument that information technology does not appear to affect the structure as much as the task that needs to be performed and the objectives of the organization. The structure is not limited to certain types because of the computer but may be enhanced by the computer (25:686). With several different structures compatible with information systems Robey suggests structure is not determined by information technology. Structural changes, in Robey's research, were due to other or related factors but not directly to information system implementation (25:686).

Robey reviews the literature of empirical research and suggests computers do not cause changes in the degree of delegation, computer systems are compatible with either a centralized or decentralized structure, and the amount and degree of delegation is related to the task environment rather than the technology being introduced (26:963-974).

Amount of Dealing With Others. The amount of dealing with others, also referred to as task interaction, is the degree an individual must work closely with other individuals or groups to perform tasks. Turner's (36:1216) research found that the computer allowed more tasks to be performed.

Jobs that dealt with clients, because more could be dealt with, will have the amount of dealing with others increase. Managers being able to retrieve information quicker, and in turn perform their tasks and decisions quicker can spend more time dealing and communicating with others.

Organizational Politics. Robey (25:679) suggests a major vein of research of the impact of information technology has been the "political" intepretation. Robey suggests the power of those who control an information system may be reinforced (25:686).

Kling and Iacono (13:1218) discuss an aspect in the later stages of computer implementation, the ways in which "organizational actors select and implement enhancements to 'existing' CBISs [computer based information systems]." They present the claim that there is an organizational political movement by some of the subunits or subusers to manipulate this procurement to the advancement of their own political position in the organization and the political position of the information system itself.

A discussion of the impact of information technology on organizational politics has been developed and is presented as follows. Implementation of an information system forces the organization to cope with differences in interactions and relations between individuals or groups as well as coping with increased technology (30:5). Robey and Markus propose that information system implementation/design could be a

political process as well as a rational process. They define a rational process as a process directed toward improving the organization's performance and achieving a predetermined goal. A political process must have two groups/individuals with different goals and a situation which allows one group to achieve its goals at the expense of the other faction's goals (30:5-9). Political conflict may generate user resistance to the extent of failure of the implementation project (30:12). Robey and Markus conclude that all participants, especially managers, should be aware of political implications and effects as well as the rational process during implementation (30:13).

Kling and Iacono (13:219) discuss an area of predominant interest in the computing 'literature,' organizational politics. They present a metaphor that takes the approach that information system development is the result of a political process. They felt that potential ramifications have rarely been discussed in the 'literature.' The political conflict normally arises when there are not enough resources for everyone.

> Because computing resources are insufficient to meet all actors needs simultaneously [12], dominant coalitions can build power by guiding the development of a CBIS to their own advantage and limiting other groups access to computing resources. How broadly groups share control of a computing infrastructure and whether patterns of control are stable over long time periods are emperical issues which can vary with organizations (13:1220).

They view organizations as groups of coalitions; one

coalition may possibly "value" certain types of information system enhancements. It is possible for coalitions to compete for control over organizational resources including information or computer systems. A coalition may try to structure control over computer resource to its advantage (13:1219).

Kling and Iacono (13:1220) report Keen's argument that the development of an information system is a political process and managers of "MIS" need the authority and resources to negotiate with other competing managers and their departments. Kling and Iacono (13:1225) performed a case study examining this political process after an information system was established. They found that organizational politics can be important in shaping an organization's use of a computer. They found "CBISs live and develop through the energies of their promoters rather than 'evolve' through a 'life of their own'" (13:1225).

Another form of organizational politics is the concept that support from the leaders in the organization is critical for the success of the information system.

> Today, information technology (IT) gives managers an opportunity (1) to improve delivery of their products and services and (2) to potentially increase their effectiveness and productivity in managing the business (32:3).

The progression of information technology has provided managers with management tools providing support for decision

making, planning and control as well as automated accounting systems (32:3). Previously, most systems have been limited to automated accounting systems (32:3).

Rockart and Crescenzi present a three phased implementation approach including determining critical success factors, decision scenarios, and prototyping. The intent of the approach is to involve top management and provide an efficient method of evolving the information system to provide what the organization actually needs. They propose some benefits from this type of approach, which appear to be benefits of a well designed decision support system as much as attributed to the implementation process. These benefits include immediate access to order status and minimizing time for customers to receive a reply to their queries. Managers have a much shorter uncertainty period as they do not have to wait on vital information and can make decisions quicker. This increases the amount of work that can be accomplished by individuals performing certain tasks. Rockart and Crescenzi specifically refer to an example of salesmen analysis of customers patterns to provide better understanding of what their customers need. Management can direct the efforts of the organization to meet the customer's needs. An analysis of historical inventory movement can allow managers to better manage their inventory and provide an automated control of inventory accounting that will catch and not allow some of the errors inherently in a manual accounting system. Improved production scheduling allows a

more optimal use of work force within resource and other constraints. By allowing more tasks to be accomplished by an individual, fewer people will be needed (32:14).

Formalization. Formalization refers to the degree the organization requires its employees to follow formal procedures and rules. A study by Lee (14:77), examining the effects of computer technology on an organization, found the computer system tended to increase formalization. The system demanded "uniformity" and "standardization" of procedures from all areas of the organization in order to support and use the new system (14:77). Robey (27:394) also mentions computers increase standardization in a job, but also indicated that other job enriching effects occurred at the same time. Increased formalization may be a positive and beneficial impact.

Level of System Use. Cerullo (2:61-65) states most organizations do not use information systems to the extent that they are capable. He presents results of a survey that inquired of different companies use of computers and found that the basic automation of clerical and accounting functions by organizations in the sixties were still the same basic functions being performed by the computer in the seventies even though the technology had advanced enough to allow more complex functions to be performed by the computer. Cerullo presents some reasons for the concept that for an organization to be successful in the future it must begin to

use some of these more complex functions and feels that this will be an evolutionary process.

Moan (17:23) indicates many organizations do not effectively use computer systems to their full potential. He credits top management for this condition. The senior level of managers needs to encourage more sophisticated use and become actively involved to receive the benefits computers have the potential of providing (17:22).

Paddock and Scamel (22:289, 290) make the distinction between what they term "data processing," the common use in what they term as pre-1970's, and the more sophisticated functions an information or computer system can provide. They feel the more sophisticated functions will have an impact on organizations. The impact will both be positive and negative (22:289, 290). Croft and Lefkowitz also discuss the use of computers and consider predominant use is the automation of tedious simple common tasks, often of clerical nature, and how more sophisticated use of computers could greatly increase overall office automation. They also present the concept that a more sophisticated system will have to be very "office specific" in order to directly aid that particular office's tasks. These tasks are the higher-level tasks that directly relate to the office's goals and functions involving "decision making, complex sequences of actions, and interactions with other people" (3:197).

Croft and Lefkowitz contend "if a new generic office tool (or set of tools) were provided many of the task

descriptions would not need to change, but the way in which they are supported would. The part of the task descriptions that would change is the mapping between steps in the tasks and the tools that implement them (3:198).

Kling and Iacono (13:1219) present, one of four areas the 'literature' predominantly discusses, the concept that equipment will progress to become "more interactive, more integrated, or more distributed" (13:1219). This suggests that with the equipment, use will also evolve to more sophisticated levels. As use evolves, the task and motivating factors will probably not be constant but change with the evolution.

Turner (36:1210) bases a model on the concept that character and use, level of sophistication, of computer systems is the independent variable that eventually leads to employee satisfaction, attitudes, and performance. He reports that, "rather than directly influencing outcomes such as job satisfaction, emotional exhaustion, absenteeism, or performance, the use of computer systems in structured jobs creates a new work environment to which operators respond" (36:1210).

Turner develops a model of information needs to complete or perform a task. In this model, workers are perceived as "open social systems" dealing with a lack of knowledge or information about their jobs. This lack creates uncertainty from two areas: one, a lack of information or knowledge of

how to perform a task and two, what to do when an exception situaion arises (36:1210). The second cause of uncertainty can come from many sources. Factors that relate to this task-related uncertainty include the nature of the task, the worker's experience and skill, and the structural arrangements among workers that govern information flow.

Turner's model is limited to five factors but he discusses how he could have used many more factors to

> describe the task portion of a work environment, including variety, task identity, feedback, etc. Due to practical limitations on the number of factors that can be represented and because other studies have found many of these variables to be highly inter related, factors have been selected that are relatively independent and are likely also to be meaningful for system designers (36:1211).

The five factors in Turner's model are: (1) The subtask to be performed, which comes from the content and level of the job. (2) The tools available for performing the subtask and their characteristics. (3) The operator's uncertainty. (4) The volume of work to be accomplished. (5) The amount of autonomy or "discretion" allowed the operator.

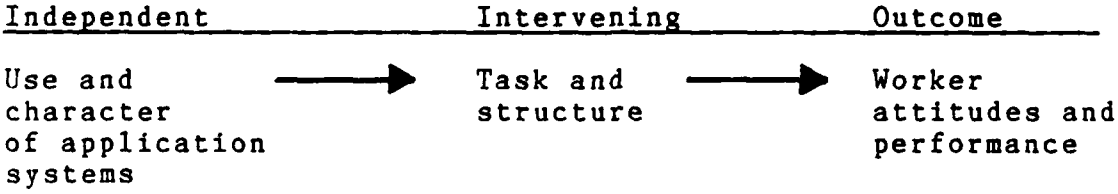


Figure 2. Task Factor Model

> Outcomes such as job satisfaction, emotional exhaustion, and productivity are influenced by the work environment, which consists of such task and structural factors as discretion, work load, problems, and interdependence. These in turn are affected by the characteristics and

> extent of applications system use. That is, worker's attitudes and performance are a function of task characteristics and structural arrangements which are, in turn, a function of the use and characteristics of an application system (36:1211).

Computer systems will cause new divisions of labor between the user and the machine. Thus, new tasks will have to be performed by the user and possibly change his perceptions of the job.

Gould and Lewis recommend three principles for the design of computer systems which include early focus on users and tasks, models and simulations should be tested in real life environments, and an "iterative" or evolutionary process of design should be pursued to allow for expansion (7:300).

Summary

Robey's results indicate a complex set of factors are impacted by information technology. These both standardize and enrich a job (27:394). He feels task research is complex and does not have "standard measureable dimensions" (27:394).

Robey suggests that response to task redesign depends or is "contigent" on individual differences and the contingency method of management is suggested (29:687-789). Job enrichment, in particular its success, may depend upon the individual the enrichment is targeted. Thus, calling for a contingency view (29:690).

Robey, in an examination of the effects of increased or new technology on a task, interpreted his results to indicate that a job change would be "stimulating" to the individuals

after the technology has been mastered and is no longer a challenge but simplifying and routinizing the work. The individual motivated in the beginning soon loses this motivation (29:698).

Pfeffer and Leblebici state the effects of information technology are still open for discussion but feel there is enough evidence to support the computer being a viable causal variable with the acknowledgement that other variables also have significant impact and these must be watched also (23:241-261). The job is most often designed around the machine and job design issues tend to be neglected (36:1217). The impact of information systems on the job tasks, and performance is an extremely complex interaction of factors. The whole job must be analyzed in order to predict the impact of an information system (36:1216).

III. Methodology

Chapter Introduction

A methodology is the "analysis of the principles or procedures of inquiry into a particular field" (40:723). This chapter presents an analysis of the principles and procedures used to answer the research questions developed in Chapter One.

Emory (6:65-66) proposes a "four-level hierarchy of questions" as a method of guiding a research effort. The first level is the "management problem or question" which begins the research process by indicating a need for information. The second level, "research question", asks for the needed information and establishes the objectives of the research effort. The "investigative questions" make up the third level. These are "specific questions" addressing the particular aspects of the research objectives. The final level in Emory's hierarchy is the "measurement level." This level establishes the questions which must be answered by either the researcher to enable the gathering of the information needed. Emory observes that research "questions are more typical in applied and descriptive studies; hypotheses are more common in causal and pure research" (6:66).

The introduction of information technology tools to help the manager perform their tasks leads to a natural

management question, "What is the impact of this technology on the operations managers?" The research objectives, outlined in Chapter One, relate to Emory's second level and were to determine the impacts of information technology on these managers and whether these impacts are positive or negative. The third level is the research questions specifically dealing with internal (job) and external (organizational) factors and were outlined in Chapter One. Emory's final level, the measurement level, identifies what information can be measured and collected, the method used to measure and collect this information within the constraints of the situation, and the type of analysis appropriate for the information gathered. This chapter concerns itself with this final level. The analysis developed in this chapter should ultimately provide answers to the management question of what the impact this technology will have on an operations branch.

This chapter describes Emory's (6:66) fourth level, the measurement question, and presents the methods used to measure, collect, and analyze the information. The population and sample, the source of information, will be described. The methods used to collect and measure the information are presented. The methods used to analyze this information concludes the chapter.

The Population and the Sample

The population consists of managers, both operational and middle managers, in civil engineering operations branches. The middle level managers include the Chief of Operations, the Deputy Chief of Operations, Chief of Resources and Requirements, Chief of Production Control, Chief of Logistics, Chief of Planning, and all the Superintendents. The operational managers are all the foremen of the shops. Information will be sought from test organizations that have implemented WIMS as well as control organizations that have not implemented WIMS. The test organizations were selected because they were part of a higher level organization that has implemented WIMS in most of its base level civil engineering operations branches. The control organizations, on the other hand, were chosen because they have not implemented WIMS in any of their civil engineering operations branches. All organizations, test and control, provide facilities maintenance functions at Air Force installations. The organizations have the same structure with both having the same levels of management and even the same positions. Both the test and the control organizations installations primary mission are support functions and not operational. The test organizations are larger than the control organizations. With all the other similarities in structure, missions, and functions, the assumption was made that the organizations are similar

enough for a comparison to determine the impact of the introduction of WIMS.

Two methods to collect data from a representative sample are randomization and sampling large numbers with respect to the whole population. The method selected was to perform a census of the test organizations operations managers and then to survey an equivalent number of control organizations operations managers. A total of 270 surveys were sent out. One half, 135, were sent to the test organizations as well as the control organizations. This worked out to 27 surveys being sent to each organization.

Survey Approval

The survey was coordinated with both higher level organizations for both the test and the control organizations. Approval was received for the survey and a survey control number was assigned by Headquarters Air Force Manpower and Personnel Center (HQ AFMPC). The letter indicating this approval and assigning the survey control number is in Appendix B.

Data Collection

Information may be gathered by either observational studies or interrogation (6:86-87). Mailed questionnaires were the particular interrogation method used.

Other methods were not selected for several reasons. The population was located at several geographically distant

locations which made personal interviews difficult and impractical. The telephone interview method was not selected due to the large amount of information desired and the difficulty of contacting the large number of operations managers. Also, personal and telephone interviews allow personal interviewer bias to become a factor.

The mailed questionnaire method was chosen as the most practical method of collecting the information. The questionnaire gave each respondent as much time as needed to answer the questions. Since each individual received the same questionnaire, interviewer bias was not a factor. Also, a mailed questionnaire may encourage answers that might have been suppressed because other methods may not be perceived as anonymous.

Mailed questionnaires have disadvantages as well. A "major weakness of the mail survey" is that it may be influenced by nonresponse (6:308). A meaningful analysis depends upon the respondents providing honest answers and that the questions be answered by the intended respondent. It was assumed that the respondents answered truthfully. Demographic questions concerning the individuals position ensured that the questionnaire was answered by the intended respondent.

The mailed questionnaire was selected as the measurement device because it was found to be the most practical and valid means of obtaining the desired

information in this situation.

The questionnaires which are discussed in detail in the next section were distributed to the each participating BCE operations branch office with each questionaire designated by position title, for example Chief of Operations and Mechanical Superintendent. A list of the position titles can be found in Appendix C.

The Measurement Instrument

Two survey instruments (see appendices D and E), mailed questionnaires, were developed one for the test bases (those that had WIMS) and one for the control bases (those that did not have WIMS). The questions were the same for both questionnaires except for two differences. Three demographic questions concerning the actual use of WIMS were not asked of the control bases' managers. Part Four, the open-ended questions, of one survey was worded differently from the other survey. The survey sent to the test organizations requested the managers' perceptions of aspects of WIMS after it had been implemented, while the survey sent to the control organizations requested the managers' perceptions of what WIMS will do when it is implemented. The open-ended questions were matched topic for topic but were phrased to be appropriate for the respondent's situation.

A pretest was not conducted because there was not a group available who had used WIMS in a managerial role. Comments and suggestions about the surveys were solicited from faculty members and other students in order to ensure the instrument was easy to comprehend, and easy to complete. Several suggestions were incorporated into the final survey instrument.

The survey began with a series of demographic questions. This portion was labeled Part One. The questions in Part One, for both surveys, dealt with items concerning the respondents' grade/rank, years of service, position, age, educational background, and experience with computers. Three questions were asked of the test group that were not asked of the control group. These three asked for the length of time the respondents had used WIMS, how often he/she used WIMS, and the length of time spent on the average task. The control group, not having WIMS, would not have been able to respond to these questions.

Parts Two and Three of the survey were based in part on questions from Hackman and Oldman's Job Diagnostic Survey. They also asked for responses concerning other factors identified in the research questions. The survey questions were numbered according to their respective Part; for example question 2.1 is the first question in Part Two and 3.2 is the second question in Part Three.

The directions to Part Two were: "These questions

concern a list of job factors that may or may not describe aspects of your job. We ask you to give us an evaluation about each factor. The evaluation concerns your agreement with the following statements. Use the following scale to select your responses and write the letter in the blank beside each statement."

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

The directions to Part Three were: "Listed below are a number of statements which could be used to describe a job. You are to indicate whether you agree or disagree with each statement as a description of your job. Write a letter in the blank beside each statement, based on the following scale:"

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

The following is a breakdown of the questions into the respective factors they were designed to measure.

Skill Variety (SV): Average of the responses to the following questions:

> A. The job requires me to do a large variety of tasks involving a large number of different skills and talents. Question (2.1)

B. The job requires me to use a large number of complex or higher level skills. Question (3.1)

C. The job is simple and repetitive. Question (3.20) (reverse scoring)

Significance: Average of the responses to the following questions:

A. The job is significant and important. Question (2.2)

B. This job is one where a lot of people can be affected by how well the work gets done. Question (3.2)

C. The job is not significant or important in the broader scheme of things. Question (3.21) (reverse scoring)

Identity: Average of the resonses to the following questions:

A. The job involves doing a "whole" and identifiable piece of work. That is the job now has a more obvious beginning and end which makes it a complete piece of work. Question (2.3)

B. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end. Question (3.3) (reverse scoring)

C. The job provides me many chances to completely finish the pieces of work I begin. Question (3.22)

Difficulty/skill level: Average of the responses to the following questions:

A. The job requires me to use a number of complex or high level skills. Question (2.4)

B. The tasks are hard and require a high skill level to perform. Question (3.4)

C. The tasks are easy, and they can be accomplished with little training or experience. Question (3.7) (reverse scoring)

D. The tasks require little experience or training and are relatively easy. Question (3.19) (reverse scoring)

Autonomy: Average of the responses to the following questions:

A. The job permits me to decide on my own how and when the work is done. Question (2.5)

B. The job denies me any chance to use my personal initiative or judgment in carrying out the work. Question (3.5) (reverse scoring)

C. The job gives me considerable opportunities for independence and freedom in how I do the work. Question (3.11)

Amount of dealing with others: Average of the responses to the following questions:

A. Dealing with other people is an absolutely essential and crucial part of doing the job. Question (2.6)

B. The job requires a large amount of cooperative work with other people. Question (3.6)

Centralization: Average of the responses to the following questions:

A. Higher level managers make a greater number of decisions that should be made by lower level managers. Question (2.7)

B. Higher level managers make more of the decisions that should be made by lower level managers. Question (3.14)

C. Lower level managers are allowed to make decisions that should be made by their supervisors. Question (3.25) (reverse scoring)

Formalization: Average of the responses to the following questions:

A. The job requires compliance with many rules and procedures. Question (2.8)

B. The organization encourages creativity and minimal compliance with rules. Question (3.15) (reverse scoring)

Job satisfaction: Average of the responses to the following questions:

A. I am satisfied with the kind of work I do in this job. Question (2.9)

B. The job is unbearable. Question (3.8) (reverse scoring)

C. I feel a lot of satisfaction about my job. Question (3.16)

Job pressure: Average of the responses to the following questions:

A. I feel a large amount of pressure in performing my work tasks. Question (2.10)

B. The pressure to perform my job is great. Question (3.9)

C. There is little pressure to perform my job. Question (3.17) (reverse scoring)

Performance feedback: Average of the responses to the following questions:

A. Managers and co-workers provide me with almost constant "feedback" about how well I am doing. Question (2.11)

B. Just doing the work required by the job provides many chances for me to figure out how well I am doing. Question (3.10)

C. The supervisor and co-workers on this job almost never give me any feedback about how well I am doing my work. Question (3.12) (reverse scoring)

D. The job itself provides few clues about whether or not I am performing well. Question (3.13) (reverse scoring)

E. Supervisors often let me know how well they think I am performing on the job. Question (3.18)

Motivating Potential Score (MPS): MPS is a measure of "the overall potential of a job to prompt internal work motivation on the part of job incumbents" (8:258). Hackman and Oldham use the following formula to determine MPS:

$$MPS = 1/3 \times (SV + TI + TS) \times AUT \times FB \qquad (1)$$

where

SV = Skill Variety

TI = Task Identity

TS = Task Significance

AUT = Autonomy

FB = Feedback

Part Four contained open-ended questions soliciting responses concerning the managers perceptions of WIMS. The questions in one survey were slightly different than in the other survey. The questionaires sent to the control group asked for the managers predictions of what the impact of WIMS will be after it is implemented. While the test group's open-ended questions discussed the same topics but from the managers perceptions of the actual impact of WIMS.

A discussion of the topics will be presented since they

apply to both questionnaires. Question 4.1, the first open-ended question, asked for perceptions of the factors impacted the most by WIMS. The second question, 4.2, asked if WIMS provided the manager with the information needed to manage the section. The five most significant contributions and negative aspects were solicited in the next two questions respectively (4.3 and 4.4). A question concerning the implementation of WIMS and concentrated on a rating of the implementation and a explanation of this rating. This question was not included in the questionnaire sent to the control group as they would not have a perception of how their implementation would be. A question designed to answer the question of what impact WIMS will have on organizational politics was included and labeled 4.6. The last question solicited an opinion of the impact WIMS had or will have on the respondent's performance.

Reliability of the Questionnaire. The reliability of a measurement device, survey instrument, refers to the accuracy of the device. The accuracy will be greatest when the variations due to error are minimal and vice versa. The method used to establish this reliability was the RELIABILITY subprogram in the SPSS software. Cronbach's alpha was the reliability coefficient examined. "If all of the variation in observed scores is due to errors of measurement, the reliability coefficient will be zero. If there is no error of measurement, the reliability

coefficient will be one" (20:249). This analysis will only be performed on Parts II and III, the only sections undergoing statistical analysis.

Data Analysis

The measurement instrument used predominantly a Likert scale (strongly disagree to strongly agree) with seven rankings. Responses to Likert data data is at least ordinal since the responses are ranked from strongly agree to strongly disagree, positive perceptions to negative perceptions (21:4). Because of the capability to rank each response higher or lower than another response, ordinal level has been achieved. The data would need to have measurable distances, equal and fixed, between the responses to meet the criteria of being an interval scale (21:5). The distance between agree and strongly agree may or may not be the same as the distance between disagree and strongly disagree, and most likely will not be the same from respondent to respondent so this data does not necessarily achieve interval level. The measurement scales should be at least interval, to be able to perform arithmetic operations, in order to use parametric tests (6:413). In recent years, researchers have increasingly made the assumption Likert's ordinal level data approximates interval level data and have used parametric data analysis. The differences between the two levels is not that clear. As reported by Moschner and

Nightengale, "He [Gardner] states that 'many summated scales yield scores that, although not strictly of interval strength, are only mildly distorted versions of the interval scale'" (19:94).

Also reported by Moschner and Nightengale,

> Bohrnstedt explains that the major concern when one assumes interval-level measurement where only ordinal measurement exists, is that some measurement errors will occur. Generally, however, the result of these type of measurement errors is the attenuation of the relationship among variables. Thus, the apparent relationships that are found among variables during the research will likely be more attenuated than they are in reality. The possibility of attenuation of the relationships among variables was, therefore, taken into consideration in the analysis of the results of the statistical tests [19:94-95].

Statistical Analysis

This portion discusses the statistical procedures used in the data analysis. The analyses was performed on the Harris 800 computer using the Statistical Package for Social Sciences (SPSS), computer applications software. This package was chosen because of its capability to perform the statistical procedures required. The SPSS was run with three files. One file was the data file which listed the responses in a coded format. Appendix F displays the coded data. Another file was the program file or the file that instructs the computer to perform tests and functions on the data. The SPSS program instructed the computer to perform arithmetic and statistical manipulations. The third file

was the output file where the results of the program were stored after the program was run.

Descriptive Statistics. Descriptive statistics, as the name implies, describes or gives a picture of the responses. Frequency counts are the actual number of responses selected and present the patterns of the responses. The subprograms FREQUENCIES, CONDESCRIPTIVE, AND CROSSTABS were used to present a clearer picture of the data. For an odd number of responses, the median is the middle number in the order of the responses; with an even number of responses, the two middle ranks are averaged. The mode is the response selected most often. "The mean is the most common measure of central tendancy for variables measured at the interval level" (21:183). The mean is also called the average and is as this term suggests is the sum of the responses divided by the number of responses (21:183). The variance "is a measure of dispersion of the data around the mean" (21:183). This is a measurement of how the responses are grouped around the mean. The variance is an important part of many statistical tests.

Statistical Tests. The basis for traditional statistical tests is hypothesis testing. In hypothesis testing, a null hypothesis is developed to determine if there is a statistical significance. "The null hypothesis is a statement that no difference exists between the parameter and the statistic being compared to it" (6:407).

The alternate hypothesis is what the reseacher is trying to prove and is the negative or opposite of the null hypothesis. The results can only be one or the other and cannot be both the null and the alternative hypotheses at the same time.

The null hypothesis is tested on the results in the data. If these results allow enough doubt, the null hypothesis is rejected. If the results do not differ enough to confidently reject the hypothesis, it may or may not be true and is not rejected. The results or the data are formed into what is termed a test statistic for testing the null hypothesis. If the test statistic is extreme then the null hypothesis can be rejected and is false. The probability that the test statistic is determined extreme when in fact it is true is the p-value. A type I error is the error of rejecting the null hypothesis when in fact the null hypothesis is true (5:101). The p-value, probability value, of a test is the smallest value of alpha that will result in rejecting the null hypothesis (5:246). Alpha is the probability of commiting a type I error that the researcher is willing to accept or at what level the researcher feels the data is significant (5:247). If the p-value is less than or equal to the alpha, critical level, for example .05 or five percent chance of a type I error, the null hypothesis is rejected. Reporting the p-value will allow the reader to reach his own conclusions on just how

significant the data is.

The critical level, alpha, of 0.05 was selected to determine statistical significance. The p-values will be presented for the readers additional information. The next sections will describe the statistical tests used.

The T-Test. The T-TEST subprogram of SPSS determines the calculated t-statistic and probability levels for determining if there is a significant difference between two sample means (21:267). A systematic approach is recommended in determining statistical differences. The systematic approach followed in this research effort is as follows:

1. Identify the parameter of interest (for example the means);
2. Identify the null and alternative hypothesis.;
3. Determine the appropriate test statistic (T);
4. Determine the rejection region;
5. Obtain, usually from tables, the critical test statistic value based on a predetermined alpha (for example .05);
6. Calculate the test statistic; and
7. Compare the calculated test statistic with the critical test staistic and determine if the null hypothesis should be rejected (5:243).

The type of test in this research effort was a two sample t-test. Two assumptions are necessary for performing

the test (5:287). The first assumption is that the populations are normal and both samples are normal random samples that are independent of each other. The second assumption is the "values of the two population variances...are equal" and unknown (5:287). Both samples came from the same population, USAF Civil Engineering Operations Managers, thus making the population variance equal for both groups. Also, both samples are independent of each other, each organization was located at separate locations and assumed to be random samples. Since the population variance is unknown, it will be estimated. If the sample variances appear different from each other, an F-test of sample variances will be performed. This test will establish whether the samples have equal variances, and the pooled variance estimate used, or have unequal variances, and the separate variance estimate used (5:292, 21:274).

Research Analysis

An analysis of the data must be performed in order to answer the questions developed to accomplish the research objectives. Research objective one was to determine the impact of WIMS on top and middle Operations Branch managers. Similarly, research objective two was to determine the impact of WIMS on middle and operational managers. This analysis answers the six research questions presented in

Chapter One. An hypothesis relating the statistical analysis to the research questions was developed. Each research question, coresponding hypothesis, and method of analysis are presented in the remainder of this section.

Research Question No. 1. What impact will WIMS have on factors such as skill variety, task significance, task identity, autonomy, feedback, difficulty/skill level, and job satisfaction.

Hypothesis No. 1: It was predicted the managers' perceptions of their task factors would be higher for the group that has implemented WIMS than the group that has not implemented WIMS.

Null hypothesis No. 1: There are no significant differences in the values of task factors between the two groups.

Method of analysis: The t-test was performed to determine if the test group's mean is signifigantly different than the control group's mean. First, the F-test was performed to determine if the sample variances are equal. Depending on these results, a one tailed t-test was performed using the appropriate pooled or separate variance estimate. Alphas, probabilities, of 0.05 were be used for both the f and the t tests. The critical values for both tests depended on the degrees of freedom. For example if the t-test had 148 degrees of freedom the critical test statistic was approximately t = -1.65. If the calculated t

value is less than -1.65 the null hypothesis was rejected and a significant difference was determined. If the calculated value did not fall into this category no conclusion was made.

Research Question No. 2. What impact will WIMS have on organizational factors such as amount of dealing with others, centralization, formalization, job pressure, and organizational politics?

Hypothesis No. 2: It was predicted the managers' perceptions of their organizational factors would be higher for the group that has implemented WIMS than the group that has not implemented WIMS.

Null hypothesis No. 2: There are no significant differences in the values of organizational factors between the two groups.

Method of analysis: Same procedure as was used for Research Question No. 1. Also responses to an open-ended question concerning organizational politics will be analyzed.

Research Question No. 3. Will the individual factors of job position, experience, education, and age be significant moderating variables?

Method of analysis: A review of cross tabulation tables will be performed to determine if any trends between these factors and use of WIMS and the average task length

exists. If there are discernable trends then they will be discussed.

Research Question No. 4. What were the positive or negative impacts of WIMS?

A review of responses to the open-ended questions concerning positive and negative factors will be presented. Descriptive statistics of the responses will be discussed to answer this question.

Research Question No. 5. What factors cause the most significant positive or negative impact?

An analysis of the most significant factors identified in answering research questions one, two, three, and four will be analyzed and compared to the open-ended responses identifed in answering research question five.

Research Question No. 6. What effect will WIMS have on the managerial performance?

A review of the open-ended responses to the question concerning WIMS impact on performance and the managers need for information to manage their section will be presented. A statistical analysis is not perceived to be of much value in analyzing open-ended questions.

Additional Information. Open-ended responses concerning implementation will be reviewed. The analysis consists of describing common responses and recommendations for change. Also, unsolicited comments will also be presented.

IV. Results

Introduction

This chapter contains the results of the analysis presented in Chapter Three. The chapter begins with a description of the respondents. An analysis of the reliability of the questions follows. The next section is a presentation of the results from the analysis performed to answer the research questions. Discussion of how these results relate to the research questions will be included with the results.

Descriptive Statistics

The survey was mailed by position title to ten bases. A list of these position titles can be found in Appendix C. The first five bases were the bases where the test group was located. These bases had all implemented WIMS, or a portion of WIMS, into the operations branch. The other five locations were bases that had not implemented WIMS into any part of their organizations and comprises the control group. The survey was mailed to 27 different positions at each base. A total of 270 surveys were mailed. A total of 150 surveys were returned which in turn is a response rate of 55 percent. Seventy responses were returned from the test locations, and 80 were returned from the control locations which is a 46 and 52 percent response rate for each group, respectively. The response rate for each position is

located in Table 4.1. The number of responses received from each base and their response rates are provided in Table 4.2. The sample is fairly well distributed between the positions and the bases solicited. There was not a trend of the data having more or less of any particular group.

Reliability

The survey questions in Parts Two and Three were analyzed for their reliability using the SPSS subprogram RELIABILITY. The questions were scaled or grouped together as they were when they were averaged to develop a composite score for the variables. These varables were compared to the extent that they measured the same thing. Cronbach's alpha was determined. This alpha or reliability coefficient indicates the variation in observed scores. The closer to one the coefficient is the less the variation in responses is due to error and conversely the closer to zero the coefficient is the more the variation is attributed to error. The values for Cronbach's alpha, reliability coefficient, are given in Table 4.3. Three variables computed from averaging the responses to similar questions were below 0.5 indicating a great degree of the measurement was due to error.

The variable Skill Variety had an alpha of 0.45328, which is just under 0.5. The questions combined to form this variable were Questions 2.1, 3.1, and 3.20. Question

TABLE 4.1

RETURN RATE OF POSITION TITLE BY GROUP

Position Discription	Number Mailed	Test Group Returned	Test Group Percent	Control Group Returned	Control Group Percent
Chief Operations	5	3	60	2	40
Deputy Chief Operations	5	4	80	4	80
Chief of R&R	5	5	100	4	80
Chief of Production Control	5	4	80	4	80
Chief of Logistics	5	2	40	2	40
Chief of Planning	5	3	60	4	80
Mechanical Superintendent	5	2	40	4	80
Structural Superintendent	5	3	60	2	40
Pavements & Grounds Superintendent	5	3	60	2	40
Electrical Superintendent	5	1	20	4	80
Sanitation Superintendent	5	3	60	2	40
Pavements Foreman	5	2	40	2	40
Equipment Operations Foreman	5	4	80	3	60
Grounds Foreman	5	2	40	0	00

TABLE 4.1 Continued

RETURN RATE OF POSITION TITLE BY GROUP

Position Discription	Number Mailed	Test Group Returned	Test Group Percent	Control Group Returned	Control Group Percent
Structural (Carpentry) Foreman	5	3	60	2	40
Protective Coating Foreman	5	1	20	3	60
Plumbing Foreman	5	3	60	2	40
Masonry Foreman	5	3	60	3	60
Metal Working Foreman	5	2	40	3	60
Refrigeration Foreman	5	3	60	2	40
Liquid Fuels Foreman	5	2	40	3	60
Heat Systems Foreman	5	2	40	2	40
Interior Electric Foreman	5	2	40	5	100
Exterior Electric Foreman	5	1	20	5	100
Power Production Foreman	5	2	40	5	100
Water and Waste Foreman	5	2	40	3	60
Entemology Foreman	5	2	40	2	40

TABLE 4.2

RETURN RATE OF SURVEY RESPONDENTS BY LOCATION

Location	Number Mailed	Number Returned	Percent of Sample
Test Locations			
A	27	14	9.3
B	27	16	10.7
C	27	14	9.3
D	27	14	9.3
E	27	12	8.3
Control Locations			
F	27	18	12.0
G	27	13	8.7
H	27	18	12.0
I	27	16	10.7
J	27	15	10.0

Note: One respondent did not provide his location so this response was not included in Table 4.2

TABLE 4.3

RELIABILITY

Factor	Questions	Reliability Coefficient (alpha)
Skill Variety	2.1,3.1,3.20	0.453
Significance	2.2,3.2,3.21	0.554
Identity	2.3,3.3,3.22	0.647
Difficulty/ Skill level	2.4,3.4,3.7,3.19	0.733
Autonomy	2.5,3.5,3.11	0.649
Amount of Dealing with Others	2.6,3.6	0.436
Centralization	2.7,3.14,3.25	0.587
Formalization	2.8,3.15	0.103
Job Satisfaction	2.9,3.8,3.16	0.676
Job Pressure	2.10,3.9,3.17	0.768
Performance Feedback	2.11,3.10, 3.12,3.13,3.18	0.704

3.20 was reversed scored because it asked for agreement of a statement that the job was simple and repetitive while the other two questions asked for agreement with a statement that the job required many different and higher level skills. For the three questions the means were 6.23 for Question 2.1, 5.614 for Question 3.1, and 5.93103 for Question 3.2. The reason for this low reliability may be due to the ordinal level data being treated as interval level.

The next two variables, amount of dealing with others and formalization, had low coefficients but were also the only two factors comprised of just two questions. Possibly averaging two questions instead of three or four was the cause of the low reliability. The variable dealing with others or job interaction was the average of the responses to Question 2.6 and 3.6. Question 2.6 requested agreement with the statement that dealing with other people is an absolutely essential and crucial part of doing the job. Question 3.6 requested agreement with the statement that the job requires a large amount of cooperative work with other people. Possibly the tone of the questions is what created the difference in the responses. The mean for Question 2.6 was 6.669 and the mean for Question 3.6 was 6.337. These values appear to be fairly close to each other with only being around three-tenths apart. Question 3.6 had a slightly higher standard deviation than Question 2.6. These standard

deviations were 0.677 for Question 2.6 and 0.809 for Question 3.6.

The last item, formalization, also was comprised of two variables and had a low reliability coefficient. This item was the average of Questions 2.8 and 3.15. The first Question, 2.8, solicited an agreement/disagreement with the statement that the job requires compliance with many rules and procedures. The second Question, 3.15, asks for agreement/disagreement with the statement that the organization encourages creativity and minimal compliance with the rules. The responses to this question were reversed scored in order for the values to indicate greater formalization with the larger value response and less formalization with the lower responses. The wording of the question, with creativity in one question and not in the other, may also have introduced error. This factor only has two questions which may add to the explanation of the low reliability. This could also be compounded by the reverse scoring, possibly the respondents rated factors more positively and less negatively. For example, marking a question strongly agree and then marking the opposite or reverse question for that factor, only slightly disagree, when the response to be equal to the positive response should have been strongly disagree. For this factor Question 2.8 had a mean of 6.148 and Question 3.15 had a mean of 4.965 which tends to support this last proposition.

The two factors that had four or more questions had high reliability coefficients suggesting an increased number of questions for each factor will increase the reliability. One of the factors had mean responses to two questions a full point apart (5.0 to 6.0) and still maintained a 0.7 reliability coefficient. The formalization factor had means that were only slightly further apart, but the reliability coefficient was much lower.

The other factors all had reliability coefficients above 0.5. This was interpreted to indicate that the responses measured relatively the same thing and the variations were substantially due to measurement and not error.

The analysis of the factors of skill variety, amount of dealing with others, and formalization will have to consider their low reliability. Any difference in these factors or conclusions made will have to be clarified or made conditionally because of the possibility the difference may be due to error.

Research Question Results

This section presents the results of the research with a discussion of their implications. The results are presented as they apply to the research questions.

Research Question #1. What impact will WIMS have on factors such as skill variety, task significance, task

identity, autonomy, feedback, difficulty/skill level, and job satisfaction?

It was predicted the factors would be higher for the test group, the group using WIMS, than the control group, the group not using WIMS. The means, standard deviations, t-values, and one tailed probabilities are shown in Table 4.4. A t-test was used to determine if a statistical difference existed between the factors for both groups. An f-test was conducted for each t-test in order to determine if the sample variances were equal. The results of this test determined whether the pooled or the separate variance estimate was used. The type of variance estimate used is noted in Table 4.4.

None of the factors were significant at the 0.05 level. Only the task significance factor was statistically different at the 0.10 level. However, for the skill variety, task significance, autonomy, feedback, and job satisfaction factors factors, the results were in the predicted direction suggesting that once WIMS becomes fully implemented managers' job characteristics will be positively impacted.

Because the overall sample did not reveal any significant differences, the sample group was subdivided into three groups in both the test and the control groups: The first group included top or senior branch managers (the Chief of Operations, the Deputy Chief of Operations, the

TABLE 4.4

T-TEST ON THE WHOLE SAMPLE INDIVIDUAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Skill Variety	6.01	0.852	5.89	0.849	-1.27	0.103
Task Identity	4.60	1.277	4.854	1.292	1.21	0.115
Task Significance	6.47	0.685	6.296	0.769	-1.47	0.072
Autonomy	5.31	0.047	5.200	1.323	-0.57*	0.287
Feedback	4.97	1.101	4.780	1.012	-1.09	0.138
Difficulty/ Skill Level	5.73	1.054	5.559	0.948	-1.06	0.146
Job Satisfaction	5.73	0.910	5.563	1.323	-0.90*	0.184
MPS	154.78	57.417	149.210	65.213	-0.55	0.291

*Note: Used the separate variance estimate on marked values and the pooled variance estimate on the rest.

R&R, the Chief of Planning, and the Chief of Production Control); The second group included middle managers (the superintendents), and the third group included operational level managers (the shop foremen). T-tests were performed on these factors between the test and the control group for each level of management. This was done to see if possibly the implementation of WIMS had impacted managers at one level more than managers at another level. The results of these tests are shown in Tables 4.5, 4.6, and 4.7.

Senior Managers. The T-test between senior managers in the test and control groups found the factor of task significance to be significant at the 0.05 level. The t value, -1.95, indicates a significant difference in the predicted direction. The control group's mean, 6.15, was less than the test group's, 6.74. This indicates the test group's perception that their job is more significant, more important, and affects a lot of people in the broader scheme of things to a greater degree than the control group's perception of their jobs. The rest of the factors were not significantly different for senior managers; however, were in the predicted direction for skill variety, task significance, autonomy, feedback, difficulty/skill level, job satisfaction and MPS.

Middle Managers. The middle managers consisted of the superintendents. The T-tests of the factors did not

TABLE 4.5

T-TEST ON SENIOR MANAGERS INDIVIDUAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Skill Variety	6.190	0.802	5.866	0.834	-1.12	0.137
Task Identity	3.796	1.150	4.110	1.540	0.67	0.254
Task Significance	6.740	0.293	6.150	1.130	-1.95*	0.034**
Autonomy	5.520	0.965	5.020	1.525	-1.14	0.132
Feedback	4.667	1.182	4.427	0.938	-0.64	0.265
Difficulty/ Skill Level	5.639	1.389	5.467	1.246	-0.37	0.357
Job Satisfaction	5.741	0.746	5.156	1.603	-1.30*	0.105
MPS	128.700	74.612	144.470	48.150	-0.73	0.236

*Note: Used the separate variance estimate on marked values and the pooled variance estimate on the rest.

**Note: Significant difference for $p < .05$

TABLE 4.6

T-TEST ON MIDDLE MANAGERS INDIVIDUAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Skill Variety	5.810	1.039	6.000	0.793	0.53	0.301
Task Identity	4.830	1.243	4.846	1.492	0.02	0.491
Task Significance	6.390	0.422	6.256	0.873	-0.49*	0.316
Autonomy	5.417	1.240	5.462	1.023	0.10	0.461
Feedback	5.117	1.207	4.846	1.840	-0.57	0.289
Difficulty/ Skill Level	5.562	0.658	5.942	0.737	1.35	0.094
Job Satisfaction	5.500	1.078	5.641	0.995	0.34	0.369
MPS	169.330	78.825	160.050	55.130	-0.34	0.367

*Note: Used the separate variance estimate on marked values and the pooled variance estimate on the rest.

TABLE 4.7

T-TEST ON OPERATIONAL MANAGERS INDIVIDUAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Skill Variety	5.976	0.821	5.817	0.814	-0.80	0.214
Task Identity	5.191	1.235	5.055	1.152	-0.47	0.321
Task Significance	6.345	0.688	6.365	0.565	0.13	0.448
Autonomy	5.417	0.883	5.119	1.398	-1.09*	0.140
Feedback	5.200	0.987	4.895	1.012	-1.25	0.109
Difficulty/ Skill Level	5.937	0.884	5.446	0.891	-2.27	0.014**
Job Satisfaction	5.976	0.806	5.471	1.370	-1.55*	0.063
MPS	166.300	50.926	152.033	65.018	-0.98	0.166

*Note: Used the separate variance estimate on marked values and the pooled variance estimate on the rest.

**Note: Significant difference for $p < .05$

show any of the factors being significantly different at the 0.05 level. One factor, difficulty/skill level, was significant at the 0.10 level but the t value was positive indicating the difference was not in the predicted direction. The test group's mean was lower than the control group's mean which may indicate that the supervisor's perception that their jobs, at locations with WIMS, do not require as many higher level skills and require as much training or experience than at the control bases.

Operational Level Managers. The operational level managers consisted of the shop foremen. The difficulty/skill level factor was significantly different at the 0.05 level in the predicted direction. Contrary to the middle manager's response, the test group indicated a higher mean than the control group. This indicates the test group formen perceive their jobs requiring greater skill level, performing more complex tasks, and require more experience and training than control foremen.

The job satisfaction factor came close to a 0.05 significance level and the test group's mean was higher than the control group's for skill variety, task identity, autonomy, feedback, difficulty/skill level, job satisfaction, and MPS.

Research Question #2. What impact will WIMS have on organizational factors such as amount of dealing with

others, centralization, formalization, job pressure, and organizational politics.

T-tests comparing the responses of the two groups were performed on all the factors except organizational politics. The organizational politics issue will be analyzed by reviewing the trends in the responses to the open ended Question 4.6.

The results of the T-tests are summarized in Tables 4.8, 4.9, 4.10, and 4.11. These tables include the mean, standard deviation, and t-values for the factors. Table 4.8 examines the sample as a whole and the other three tables display the results of the t-test comparing the senior, middle, and the operational levels of management of the test group compared to the control group.

Whole Sample. The factor, amount of dealing with others, was significantly different at the 0.05 level. The test mean was higher than the control mean. It is possible that because WIMS automates more activities, that personnel now have a greater opportunity to interact. The other factors do not allow any conclusion to be made about the impact of WIMS.

Subdivided Samples. As revealed in Tables 4.9, 4.10, and 4.11, there were no significant differences for the organizational factors when the sample was subdivided into senior, middle, and operational managers.

TABLE 4.8

T-TEST ON THE WHOLE SAMPLE ORGANIZATIONAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Amount of Dealing With Others	6.590	0.520	6.430	0.640	-1.68	0.048
Centralization	4.920	1.312	4.760	1.163	-0.77	0.220
Formalization	5.510	1.034	5.640	0.830	0.86	0.197
Job Pressure	5.020	1.501	4.950	1.277	-0.32	0.374

TABLE 4.9

T-TEST ON SENIOR MANAGERS ORGANIZATIONAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Amount of Dealing With Others	6.778	0.352	6.767	0.320	-0.09	0.463
Centralization	5.074	1.094	5.044	1.030	-0.08	0.469
Formalization	5.361	0.967	5.533	0.915	0.52	0.303
Job Pressure	5.611	1.024	5.244	1.640	-0.78	0.220

TABLE 4.10

T-TEST ON MIDDLE MANAGERS ORGANIZATIONAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Amount of Dealing With Others	6.380	0.483	6.230	0.857	-0.51	0.307
Centralization	4.970	1.547	5.230	1.040	0.49	0.313
Formalization	5.170	0.961	5.580	0.954	1.07	0.148
Job Pressure	4.830	1.389	4.692	1.158	-0.28	0.393

TABLE 4.11

T-TEST ON OPERATIONAL MANAGERS ORGANIZATIONAL FACTORS

Factor	Test Group M	Test Group SD	Control Group M	Control Group SD	T-VALUE	1-TAIL PROBABILITY
Amount of Dealing With Others	6.571	0.589	6.357	0.647	-1.41	0.082
Centralization	4.607	1.302	4.523	1.210	-0.27	0.393
Formalization	5.571	1.136	5.679	0.787	0.43*	0.333
Job Pressure	4.583	1.742	4.921	1.264	0.94	0.175

*Note: Used the separate variance estimate on marked values and the pooled variance estimate on the rest.

Consequently, it appears that WIMS has not significantly impacted the organizational factors.

Organizational Politics. The organizational politics factor was analyzed by a review of the responses to the open-ended Question 4.6. This question was:

> Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

The responses to this question generally fell into seven broad categories (See Table 4.12). The first category was the increased influence from forces outside the branch. It was predicted that the systems operators, usually located in the industrial engineering branch, would be perceived as having increased power because of his control of WIMS. Only one Chief of Operations mentioned system operator control.

The greatest number of responses mentioned increased influence that they themselves (the respondents) personally had on how things were performed. This was not restricted to any particular level of management, but was mentioned at all levels. The comments usually referred to an ability to plan, organize, and coordinate work better due to WIMS.

The category where managers perceived their subordinates' influence increasing received eight responses. Two out of four Chiefs of Planning indicated this

TABLE 4.12

ORGANIZATIONAL POLITICS CATEGORIES OF RESPONSES

Increased Influence	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Self	2	2			1	4	3
Subordinates	1	1	1		2	3	
Superiors			1	1	1	1	2
Outside	1						
"NO"			2			2	4
General Positive							5

perception. Planners use WIMS to perform their work which may suggest WIMS is helping their performance and in turn increasing their influence.

Another category that received eight comments was the "no" category where the respondent indicated that there was no impact of WIMS on any individual or group's influence in the organization. Fifty percent of these responses were from foremen.

Six respondents felt their superior's, or supervisor's, influence had increased. Chief of Operations probably did not respond in this category because most BCEs do not use WIMS yet. This may indicate a perception of closer supervision and that WIMS is increasing managers' control of their subordinates.

Five foremen responded with general comments that WIMS is a positive influence. The nature of the comments gave the impression that the respondents were only slightly familiar with the system.

Only one respondent, Chief of Resource and Requirements, indicated a negative response. The bulk of the responses were positive indicating the organizational politics impact is a positive one.

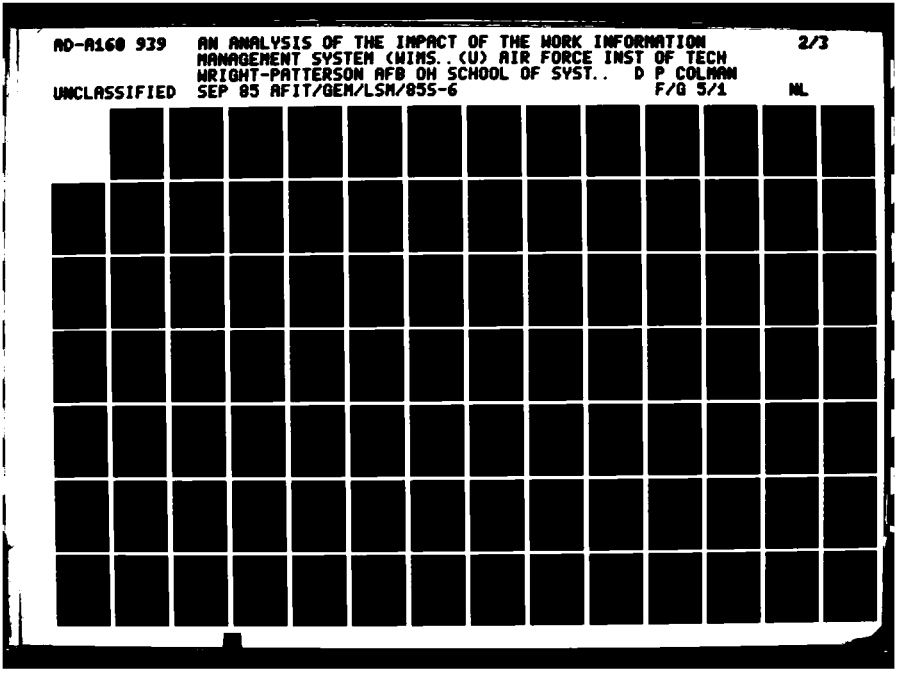
Research Question #3. Will the individual factors of job position experience, education, and age be significant moderating variables?

This research question will be answered by analyzing responses to the average use of WIMS, times per month/week, and the length of tasks on WIMS in relation to the respondent's experience, education, and age.

Crosstabulation, an SPSS subprogram, was used to indicate any trends in the responses. One factor that did show a noticable trend in usage was the job position (See Table 4.13). Sixteen of seventeen senior managers used WIMS greater than two to five times a week. Middle managers had over fifty percent in the greater than two to fives times a week category with only four respondents less than two to five times a week. Foremen had the majority indicating that they used WIMS less than once a month and only a few (10 of 27) using it more.

The crosstabulation of job positions with the average time an individual spent performing a task on WIMS did not reveal any trends (See Table 4.14). The job positions were concentrated around the quarter hour task time with all but one job position having responses greater than three quarter hours average task times.

The years of service was assumed to be an indicator of experience. A cross- tabulation of responses of time in service against the frequency of use depicted widely dispersed responses (See Table 4.15). There did not appear to be a trend based on these two factors.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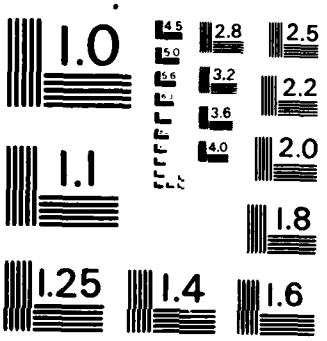

TABLE 4.13

CROSSTABULATION OF JOB POSITIONS WITH FREQUENCY OF USING WIMS

Frequency	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Less than Once a Month	1					2	17
2-3 times a Month							1
Once a Week						2	3
2-5 times a Week	2		2	1	1	5	3
More than 5 times a Week	2	4	3	3	2	3	3

TABLE 4.14

CROSSTABULATION OF JOB POSITIONS WITH AVERAGE TIME TO PERFORM A TASK

Frequency	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
0 minutes	1					3	16
15 minutes	3	1	2	3	1	4	5
30 minutes		2		1	1	3	4
45 minutes			1				
Greater than 45 minutes	1	1	2		1	2	3

TABLE 4.15

CROSSTABULATION OF TIME IN SERVICE WITH FREQUENCY OF USING WIMS

Frequency	Less than 4 yrs.	5-8 yrs.	9-12 yrs.	13-16 yrs.	17-20 yrs.	21-24 yrs.	25-28 yrs.	29-32 yrs.	Greater than 32 yrs.
Less than Once a Month	1	1	1	5	3		7	2	2
2-3 times a Month			1						
Once a Week			1		2	1		1	1
2-5 times a Week		2	3	1	1	3	4	1	1
More than 5 times a Week		1	2	5	2	3	2	3	2

The experience or time in service versus the average time each task performed on WIMS was analyzed. This cross tabulation (See Table 4.16) indicated that the individuals with greater than 24 years time in service all spent one-half hour or less as an average on WIMS. Individuals with less time in service indicated a tendancy for longer average task times. The vast majority of responses of individuals who do use WIMS were in the one-quarter hour or less average task.

Education did appear to be a factor in the frequency of use (See Table 4.17). The majority of the respondents with Bachelor degrees and higher indicated that they used WIMS more often. Two respondents in this group indicated that they used WIMS less than once *a month*, probably meaning they did not use WIMS at all. The rest indicated that they used WIMS more than three times a month with seven out of 12 indicating that they used it more than five times a week.

The respondents with less than a Bachelor degree had a more evenly distributed range or responses with the bulk of respondents using WIMS more than once a week.

Comparing education level with the average task length (See Table 4.18) revealed a trend that the respondents who averaged over fifteen minutes tended to be from the lesser educated levels. All three respondents with Masters degrees responded that their average task took one-quarter hour.

TABLE 4.16

CROSSTABULATION OF TIME IN SERVICE WITH AVERAGE TIME TO PERFORM A TASK

Average Task Time	Less than 4 yrs.	5-8 yrs.	9-12 yrs.	13-16 yrs.	17-20 yrs.	21-24 yrs.	25-28 yrs.	29-32 yrs.	Greater than 32 yrs.
0 minutes	1	1	1	3	2	1	6	2	3
15 minutes		1	3	2	3	4	4	3	2
30 minutes			2	2	1		3	2	1
45 minutes			1						
Greater than 45 minutes		2	1	3	2	2			

TABLE 4.17

CROSSTABULATION OF EDUCATION WITH FREQUENCY OF USING WIMS

Frequency	High School Degree	Some College No Degree	Associate's Degree	Bachelor's Degree	Postgraduate Classes No Degree	Master's Degree
Less than Once a Month	6	11	2	1		1
2-3 times a Month			1			
Once a Week	1	4	1			
2-5 times a Week	3	4	4	3	1	1
More than 5 times a Week	2	10	1	5		2

TABLE 4.18

CROSSTABULATION OF EDUCATION WITH AVERAGE TIME TO PERFORM A TASK

Average Task Time	High School Degree	Some College No Degree	Associate's Degree	Bachelor's Degree	Postgraduate Classes No Degree	Master's Degree
0 minutes	5	10	4	1		1
15 minutes	4	8	3	4		3
30 minutes	2	6	3			
45 minutes				1		
Greater than 45 minutes	1	5		3	1	

The other categories were fairly evenly distributed with the bulk of responses in the one-quarter hour average task time.

The next variable examined was age against frequency of use (See Table 4.19). The ages of respondents was quite evenly distrubuted for users that average once a week to greater than five times a week. There was not a discernable trend in the relationship between these variables.

The average task time on the computer was fairly distributed between the ages (See Table 4.20). Eight out of ten responses of average task times greater than one-half hour were from 26 to 40 years old. This suggests that younger individuals may be more prone to spending more time on the computer but for the most part, this factor seems fairly evenly distributed.

On the whole, these factors of experience, education, and age did not have any real prominant trends. There were a few suggested, but use and average length of tasks appears to be evenly distributed and not dependent on these factors.

Research Question #4. What are the positive and negative impacts of WIMS?

This research question was answered by analyzing the responses to the open-ended Questions 4.3 and 4.4. Questions asked the respondent to list the five most significant contributions and the five most negative aspects, respectively.

Positive Impacts. The general areas mentioned as

TABLE 4.19

CROSSTABULATION OF AGE WITH FREQUENCY OF USING WIMS

Frequency	26-30 yrs. old	31-35 yrs. old	36-40 yrs. old	41-45 yrs. old	46-50 yrs. old	51-55 yrs. old	56-60 yrs. old	Greater than 60 yrs. old
Less than Once a Month		6	2	6	4	1	1	1
2-3 times a Month	1							
Once a Week	1	1	1	1	1	1		
2-5 times a Week	3	3	3	2	1	4		
More than 5 times a Week	1	5	2	4	1	6	1	

TABLE 4.20

CROSSTABULATION OF AGE WITH AVERAGE TIME TO PERFORM A TASK

Average Task Time	26-30 yrs. old	31-35 yrs. old	36-40 yrs. old	41-45 yrs. old	46-50 yrs. old	51-55 yrs. old	56-60 yrs. old	Greater than 60 yrs. old
0 minutes		5	1	8	4	1	1	1
15 minutes	2	4	3	5	2	5	1	
30 minutes	1	2	2	1	1	4		
45 minutes		1						
Greater than 45 minutes	2	3	2		2			

significant contributions (See Table 4.21) included management of work documents, management of work, information transfer, and system features.

Management of Work Documents. Management of work documents was by for the most mentioned positive contributions. In this category, improvements included paper reduction, time savings, W/O and J/O tracking, better time accountability, improved scheduling documents, faster handling of documents, historical recall, and ease of formation of reports. Responses from all job positions mentioned these aspects more time than any other.

Management of Work. Actual help in managing the work was the next most often mentioned contribution. This contribution included saving manpower, improved efficiency, positive control of work force, better control of jobs or work, enhanced productivity monitoring, and an improved executive management tool.

Information Transfer. The information transfer category included improved internal information flow within the organization and improved external information flow to sources outside the organization, communication of information. Comments included better customer relations because of quicker more professional response to their queries. Also, comments on information availability to superior and peers for better decisions and coordination were included. This item received greater

TABLE 4.21

CROSSTABULATION OF JOB POSITIONS WITH SIGNIFICANT CONTRIBUTIONS OF WIMS

Contribution	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Management of Work Documents	10	17	10	16	10	27	42
Management of Work	8	5	3	3	6	13	18
Information Transfer	5	1	2	2	1	3	6
Systems Features	4	1	6	3	1	1	2

response from senior managers and minimal response from middle and operational managers.

System Features. The last category only received a few comments which included the ease of use, user friendliness, and expandability of the system.

Negative Impacts. The negative aspects of WIMS, as perceived by the respondents, included five categories. These categories are hardware problems, software problems, system dependence, lack of training, and implementation (See Table 4.22).

Software Problems. The most mentioned negative factor involved software problems. Comments discussed limitations on transferring information between shops and to other areas in the organization, ability to handle multiple shop work documents, and not having anyone who could write Fortran programs.

Hardware Problems. The second most mentioned factor was hardware problems. This factor included comments on the lack of terminals, lack of storage space, hardware wearing out, and loss of da .

System Dependence. The system dependence category is related to hardware problems. This area included comments on how work stopped when the system went down. This was usually mentioned in terms of planners, controllers, production control, and service call operators not performing their functions when the system was down.

TABLE 4.22

CROSSTABULATION OF JOB POSITIONS WITH NEGATIVE IMPACTS

Negative Impacts	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Hardware	4	6	4	11	1	4	1
Software	5	3	7	7	7	11	16
System Dependence	1	1		2	1	2	3
Lack of Training	4	1	2				
Implementation	4	1					
Positives Outweigh Negatives	1			1		3	1
Inaccurate Data	1		2				3

Lack of Training. The fourth most negative area dealt with the problem of a lack of training. Respondents indicated that few people know the system languages. A lack of training aids was also mentioned as a negative aspect.

Implementation. The fifth negative cateogry mentioned was system implementation problems. These appeared to be respondents' observations of people's resistance to change, a lack of acceptance, and difficult transition periods.

Positives Outweigh Negatives. The sixth category included comments on perceptions of no negative features or any negative features were more than compensated for by positive features.

Inaccurate Data. The last category included comments on inaccurate data and how the information was only as good as the individual in putting the information.

Research Question #5. What factors cause the most significant positive or negative impact?

This research question was answered by analyzing the responses to the open-ended Question 4.1. Question 4.1 solicited comments on the respondent's perception of what factors were impacted the most by WIMS and which ones impacted performance the most. The responses to this question were categorized into four broad categories. These categories included management of work documents, management

of work, negative responses, and other factors (See Table 4.23).

Management of Work Documents. The factor mentioned the most was management of work documents. The factor was mentioned 30 out of 47, 64 percent of the responses. This category included comments on paper reduction, tracking work orders and job orders, elimination of manual files, speed, enhancement of labor reporting, and improved accountability. These factors all contribute to the underlying perception that WIMS is able to provide more performance indicators, so managers are able to increase their control over the work.

Management of Work. The second most mentioned factor, 10 out of 47 (21 percent), was the management of the work. This factor included better job order management, improved job planning, improved performance, time savings, increased efficiency, increased control over what is going on, and the ability to supervise has increased. The responses were positive and discussed attributes of how WIMS improved the management of the Operations Branch.

Negative Comments. Negative comments on WIMS, four out of 47, were relatively few; in fact, it was only a eight per cent response rate. These comments dealt with down time and the negative effect on work because of dependence on the system, being tied to the computer, and the lack of training.

TABLE 4.23

CROSSTABULATION OF JOB POSITIONS WITH THE MOST SIGNIFICANT FACTORS

Factors	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Management of Work Documents	2	3		4	6	9	6
Management of Work	3	2	2			1	2
Negative Responses			1	2			1
Other Factors	2			1			

Other Factors. Other factors were mentioned and included system features, increased decentralization, and better customer support.

Research Question #6. What effect will WIMS have on the managerial performance?

The analysis performed to answer this question was to review the responses to the open-ended Questions 4.2 and 4.7.

Question 4.2 solicited a yes or no response to a question asking if WIMS provides the information needed for the manager to manage the section/branch (See Table 4.24). Forty respondents answered "yes" that WIMS provided the information needed. Ten of the respondents answered "no." In their "no" response, they indicated changes needed to be made. These changes included that the data needs to be made accurate, needs to be interfaced with BEAMS, and needs to be able to handle multi-shop job and work orders. Seven respondents answered that they were undecided or the system did not provide the information needed now but had the potential to. Fourteen, twelve foremen, made no response which possibly indicated that they do not directly receive information from WIMS.

Question 4.7 asked respondents to describe the success of WIMS in terms of the impact it has had on their performance. The responses to this question were varied and covered many areas (See Table 4.25). The top category was

TABLE 4.24

CROSSTABULATION OF JOB POSITIONS WITH RESPONSES TO
DOES WIMS PROVIDE INFORMATION NEEDED

Answers	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Yes	2	4	3	3	2	7	19
No	3		1	1		2	3
Undecided				1	1	2	3
No Response						2	12

TABLE 4.25

CROSSTABULATION OF JOB POSITIONS WITH IMPACT ON PERFORMANCE

Impacts	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Improved Management of Work	3	3	2	2	2	7	5
Increased Information Transfer	1	2	2	2		5	
Positive Impact	2	1			1	1	4
None or Negative			1	2		2	30
Customer Satisfaction	1		1	2		1	

the actual improvement of managing the work, especially the increased control of the work. The next area was increased availability of information so decisions made and actions taken are much faster than before they had WIMS. There were nine general positive comments. Comments that WIMS had no impact on performance or had a negative impact was largely due to a great number of foremen not responding. Improved customer response was also mentioned as a by-product of WIMS. The great majority reported a postitive beneficial impact of WIMS on their performance.

Implementation

The response to an open-ended question, 4.5, requesting a rating of the implementation of WIMS was reviewed (See Table 4.26). Senior managers tended to rate the implementation excellent and outstanding more consistently than the middle and operational levels of management. The superintendents and foremen tended to rate noticable lower as a group. The overall results tend to suggest implementation was successful.

The question also requested an explanation of why the particular rating was given. The comments mention the benefits of WIMS for the positive ratings. Negative responses were explained by several factors including a lack of documentation, training, and equipment. A few software problems were mentioned. There were some perceptions the

TABLE 4.26

CROSSTABULATION OF JOB POSITIONS WITH IMPLEMENTATION RATING

Ratings	Chief Operations	Deputy Chief Operations	R&R	Chief Production Control	Chief Planning	Superintendents	Foremen
Outstanding	2						
Excellent	1	2		3	3	5	6
Satisfactory	2	1	1	1		4	12
Marginal		1	2	1		1	1
Unsatisfactory						1	
Unknown			1			1	17

software needed to be redesigned for the respondents specific needs and situations.

But on the whole, the implementation of WIMS at these locations appeared very successful and did not create long term problems. The organizations seem to have accepted and are using WIMS.

The Control Groups Predictions

The responses to the open ended questions sent to the control group were reviewed in search of common perceptions that may affect future implementaton. A large majority of the respondents indicated they had never heard of or knew too little to respond to the questions. Many of the responses that were answered also indicated the respondents knew little about WIMS.

The managers that seemed to have a grasp of what WIMS is had a wide range of perceptions of what its impact would be. These perceptions ranged from not perceiving an impact at all to WIMS solving all their problems. Some perceptions of interest from an implementation standpoint included a fear WIMS would reduce personnel and jobs, WIMS would be misused to invade personal privacy, and the organization would become overly dependent on WIMS.

The results of the analysis presented in this chapter will form the basis for the conclusions and recommendations made in the next chapter. The next chapter will present a

discussion of the potential significance of these findings and recomendations that address some of the issues raised in this research.

V. Conclusions and Recommendations

Introduction

This chapter presents an overview of the project, the conclusions based on the results of the analysis, and outlines recommendations for future research and areas for further development.

Research Overview

This research project was conducted to determine the impact of a new Work Information Management System on the managers in civil engineering's operations branch. The objectives of the research were concerned with the senior managers', middle managers', and operational managers' job factors and their perceptions of WIMS.

Mailed surveys were used to obtain managers' perceptions of their jobs and WIMS. The surveys were sent to two groups, a test group that had implemented WIMS and a control group that had not implemented WIMS. The responses from the test group were compared against the responses of the control group to determine if there were significant differences for various factors. An analysis was also performed on open-ended questions to determine the positive and negative impacts of WIMS. The results of these analyses were presented in Chapter Four. The conclusions were based on those results.

Conclusions

The research questions that guided the project will provide the framework for the conclusions.

Research Question 1. What impact will WIMS have on factors such as skill variety, task identity, autonomy, feedback, difficulty/skill level, and job satisfaction?

The results revealed there was not a significant difference between the test group and the control group for these factors. The test group did score higher on most of the factors but not high enough to be statistically different. When the two groups were divided into senior, middle, and operational levels of management and then compared between groups, a few factors were found to be significant for the different groups. The senior managers at the test locations perceived their jobs to be more significant, more important, and affecting more people than the control group. This may indicate WIMS enables senior managers to manage more effectively and they perceive their contributions are more significant. The middle managers did not reveal any factors significantly different at the 0.05 level. For the operational managers, the test group indicated their jobs were more difficult and required higher skill levels than the control group. A possible explanation for this is the managers, using WIMS, may have greater control and demand more from their operational managers. The other factors did not show a significant difference.

Because of the minimal differences, we cannot conclude WIMS has impacted these managers' internal job factors significantly. The test group consistently indicated that a higher mean may suggest that if there is an impact, even though small, it is a positive one. The finding of different factors significant for the different levels of managers indicates that WIMS impacts these levels differently. A reason for these results may be the partial implementation of WIMS at some locations.

Research Question 2. What impact will WIMS have on organizational factors such as amount of dealing with others, centralization, formalization, job pressure, and organizational politics?

The organizational factors of centralization, formalization, and job pressure did not reveal any significant differences between the test and the control groups. The test group, whole sample, perceived dealing with other people a more essential and crucial part of doing their jobs than the control group. This may indicate that WIMS, by automating time consuming tasks, allows the managers to spend more time communicating and coordinating with other people. When examined separately the senior, middle, and the operational managers did not have any factors significantly different between groups. The factor of organizational politics was analyzed by reviewing the responses to an open-ended question. The results indicated

that the respondents felt WIMS increased their own influence. Subordinates and superiors were perceived to have increased their influence. The prediction that systems administrators would increase their influence was not substantiated.

The conclusion that can be made from these results is that the organizational factors were not significantly affected by WIMS. The organizational politics factor indicated perceptions of increased influence for members and users within the operations branch. The increased influence was seen as a result of these individuals' ability to plan, organize, and coordinate work better. There does not appear to be power struggles between the operations branch and the systems administrators. Potentially, when other branches besides operations begin to use WIMS this factor could become more significant.

Research Question 3. Will the individual factors of experience, education, and age be significant moderating variables?

Examinations of cross tabulations of the individual factors with the frequency of using WIMS and the average task length did reveal some trends. Individuals with less time in service tended to spend greater amounts of time on tasks performed on WIMS. The respondents with higher levels of education indicated a higher or more frequent use of WIMS. While, respondents with lower levels of education

tended to spend more time on their WIMS related tasks. One factor that did show a discernable trend was job position with frequency of use. Senior managers show a definite higher or more frequent use of WIMS than do superintendents who in turn show a slightly higher use than do the foremen.

The conclusion that can be drawn is that regardless of the factors of experience, age, and education WIMS is being used by individuals at all levels. WIMS is being used by the operations branch managers and most frequently by the senior managers.

Research Question 4. What are the positive and negative impacts of WIMS?

The most mentioned significant contribution was improved management of work documents. This was followed by improved management of work, information transfer, and system features. The negative impacts included hardware problems, software problems, management control increases, lack of training, and implementation problems.

The fact that the most mentioned positive factor was the improved management or handling of work documents suggests that WIMS is at the transaction recording level of sophistication. This implies that WIMS is at a low level in terms of sophistication of use. This conclusion is further supported by no mention of models or other decision aids as significant contributions. The improved management of the work was attributed to faster, reliable information. The

negative impacts appeared to be mainly related to hardware and software. Potentially these types of problems can be altered as the system evolves and the Air Force obtains more equipment.

Research Question 5. What factors cause the most significant positive or negative impact?

The response indicated most often was improved management of work documents. The next most often mentioned factor was improved management of work. There were only a few negative impacts mentioned and those were hardware problems, software problems, lack of training, and implementation problems.

The conclusion from these results is that the impact of WIMS is perceived as positive with only minimal negative perceptions. The most significant factor was the management of work documents, again lending support to the concept that WIMS is still in the transaction processing stage and is not being used for more sophisticated uses. The positive perceptions indicate that WIMS implementation has been predominately successful at the test bases, and the system is meeting the expectations of most of the users.

Research Question 6. What effect will WIMS have on managerial performance?

Almost eighty percent of the respondents indicated that WIMS provided enough information for them to manage their section/branch. A minority that felt WIMS did not provide

the information needed and indicated reasons for this which included inaccurate data and problems with both the hardware and software. The respondents' perceptions of the success of WIMS in terms of their performance were for the majority very positive and that WIMS is successful. One of the areas discussed was an improved ability to manage which included increased control over the work. Improved customer response was also mentioned as a by-product of WIMS. With the ability to retrieve information quickly, the customer receives answers to his/her questions more responsively, giving the organization a more professional appearance.

The effect of WIMS is a positive one, and it seems to be an aid in the management of operations branches.

Other Factors. Other factors were examined. These factors included implementation and the control group's responses. The results indicate that the implementation of WIMS was successful at the test bases. The control group's responses to the open-ended questions indicated a large majority were not aware of WIMS and consequently, they, did not provide any answers. There were a few fears expressed about the implementation of WIMS, but the majority expressed positive expectations.

Overall Conclusions

The test bases' operations branches are using WIMS, and it is providing a positive impact on these organizations.

The impact was not great enough to impact the task, organizational, and individual factors. This may be due to the low sophistication of the use of WIMS. At this stage, WIMS may only be automating the paperwork and providing the same basic information as was used before WIMS was implemented. This could account for the various job factors being perceived the same by managers at both WIMS and non-WIMS bases. Possibly, when the level of sophistication of WIMS use evolves to a higher level the impact on these job factors will increase.

Regardless of the impact on the job factors, WIMS, is perceived as providing positive benefits to operations branch managers. It's implementation was perceived as successful and it appears to be improving the management effectiveness of the operations branches, which should lead to increased mission effectiveness.

Recommendations

The following section outlines recommendations for further research and areas for development of WIMS.

Further Research. Further research should be conducted. A longitudinal study would allow one to determine the impact of WIMS as it becomes fully developed. Future research should also consider the sophistication level of the system uses.

Areas for Development. There were two areas for development identified. The first area was sophisticated or higher level uses of WIMS. These uses should include decision models, forecasting models, performance standard models that track productivity, and other analysis procedures WIMS is capable of accomplishing.

The second area for development is a means to minimize the negative impacts and features. The negative impacts and features include software problems, hardware problems, system dependence, lack of training, and implementation problems. These items need to be addressed to maximize the ability of WIMS to help civil engineering managers improve their performance and achieve greater mission effectiveness.

Appendix A: List of Civil Engineering Terms

IWP - Inservice Work Plan (IWP) "is used to ensure the work force is productive and the most important work is to be done first"(85-1:10). The plan is intended to consider resource, personnel, material, and fund constraints and schedule work to maximize productivity, work completion without stoppage, and meeting commitments. The work is programed by month (85-1:10).

Production Control Center (PCC) - "is the location in the BCE organization where information passes to and from the work force. It also serves, through the customer service center (CSU), as a single point of contact between BCE and its customers. Programing and scheduling functions are also the responsibility of the PCC.

Service Call - manages the emergency and urgent job orders. These job order requests are normally recieved by telephone and DIN trucks are dispatchted.

Do-It-Now (DIN) - emergency response system that consists of trucks equiped with radios that are manned and equiped to handle most emergency and urgent work.

Appendix B: Survey Approval Letter

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MANPOWER AND PERSONNEL CENTER
RANDOLPH AIR FORCE BASE TX 78150

29 APR 1985

MPCYPS

Work Information Management System (WIMS) Impact Survey

AFIT/LS (Lt Coleman)

1. As discussed on 26 Apr, we have approved your survey request, with the inclusion of the control group in your project design and reworking of your questionnaire. Your USAF Survey Control Number (SCN) is 85-44. This SCN expires 31 August 1985, and it should appear on the front of each survey booklet.

2. Your revised design should allow you to make more confident statements about your data. If you have any questions about the evaluation, please contact me at HQ AFMPC/MPCYPS, AV 487-5680.

FOR THE COMMANDER

Frederick W Gibson

FREDERICK W. GIBSON, Capt, USAF
Acting Chief, Personnel Survey Branch

Appendix C: List of Position Titles

Position Titles Surveyed

1. Chief of Operations
2. Deputy Chief of Operations
3. Chief Resources and Requirments or Chief of Requirements
4. Chief of Production Control
5. Chief of Logistics
6. Chief of Planning
7. Mechanical Superintendent
8. Structural Superintendent
9. Pavement and Grounds Superintendent
10. Electrical Superintendent
11. Sanitation Superintendent
12. Pavements Foreman
13. Equipment Operations Foreman
14. Grounds Foreman
15. Structural (Carpentry) Foreman
16. Protective Coating Foreman
17. Plumbing Foreman
18. Masonry Foreman
19. Metal Working Foreman
20. Refrigeration Foreman
21. Liquid Fuels Foreman
22. Heat Systems Foreman

Position Titles Surveyed

23. Interior Electrical Foreman
24. Exterior Electrical Foreman
25. Power Production Foreman
26. Water and Waste Foreman
27. Entomology Foreman

Base Designation

A. Test Base
B. Test Base
C. Test Base
D. Test Base
E. Test Base
F. Control Base
G. Control Base
H. Control Base
I. Control Base
J. Control Base

Appendix D: Test Group Survey

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433-6583

1 MAY 1985

REPLY TO ATTN OF: LS (Lt Colman, AV 785-7212)

SUBJECT: Work Information Management System (WIMS) Impact Survey

TO:

1. Please take the time to complete the attached questionnaire, and return it to us in the enclosed envelope by 12 June 1985.

2. The survey measures your perceptions and attitudes toward the impact of the Work Information Management System (WIMS) on your job and job environment. The data we gather will become part of an AFIT research project which will be provided to the Air Force Engineering and Services Center to help them improve future implementation of WIMS technology. Your individual responses will be combined with others and will not be attributed to you personally nor to your unit's location.

3. Your participation is completely voluntary, but we would certainly appreciate your help.

LARRY L. SMITH, Colonel, USAF
Dean
School of Systems and Logistics

2 Atch
1. Questionnaire
2. Return Envelope

USAF SCN 85-44

AIR FORCE - A GREAT WAY OF LIFE

WORK INFORMATION MANAGEMENT SYSTEM (WIMS) IMPACT SURVEY

PART I--BACKGROUND INFORMATION

For multiple choice questions, circle the appropriate response.

1. My current grade is _____.

   a. E-1 through E-4
   b. E-5 through E-6
   c. E-7 through E-9
   d. O-1 through O-2
   e. O-3
   f. O-4
   g. WG-1 through WG-3
   h. WG-4 through WG-5
   i. WG-6 through WG-7
   j. WG-8 through WG-9
   k. WG-10 through WG-11
   l. WG-12 and up
   m. Other _____ (specify)

2. I have _____ years of service (military and/or civil).

   a. 4 years or less
   b. 5 to 8 years
   c. 9 to 12 years
   d. 13 to 16 years
   e. 17 to 20 years
   f. 21 to 24 years
   g. 25 to 28 years
   h. 29 to 32 years
   i. over 32 years

3. My job title is _____.

   a. Chief Operations
   b. Deputy Chief Operations
   c. Chief Resources and Requirements
   d. Chief of Production Control
   e. Chief Logistics
   f. Superintendent
   g. Foreman
   h. Chief Planning
   i. Chief Requirements
   j. Other

4. My age is _____.

a. 20 or less
b. 21-25
c. 26-30
d. 31-35
e. 36-40
f. 41-45
g. 46-50
h. 51-55
i. 56-60
j. over 60

5. Education _____.

a. Non high school graduate
b. High school graduate or GED
c. Some college but no degree
d. Associate's degree
e. Bachelor's degree
f. Postgraduate classes but no degree
g. Master's degree

6. My experience with computers includes (mark as many as applicable) _____.

a. No experience
b. Some experience in school
c. I own a personal computer
d. Using Air Force computer systems (such as BEAMS)
e. Other (Please explain) _____

_____

7. I have worked with WIMS _____.

a. None
b. Up to 1 month
c. Over 1 month to 3 months
d. Over 3 months to 6 months
e. Over 6 months to 1 year
f. Over 1 year to 2 year
g. Over 2 years

8. I use WIMS on an average of _____.

a. Less than once a month
b. Once a month
c. Two to three times a month
d. Once a week
e. Two to five times a week
f. More than five times a week

9. How long do your average tasks on the WIMS take. (specify to the nearest quarter hour)

_____

PART TWO

These questions concern a list of job factors that may or may not describe aspects of your job. We ask you to give us an evaluation about each factor. The evaluation concerns your agreement with the following statements. Use the following scale to select your responses and write the letter in the blank beside each statement.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

****

____2.1. The job requires me to do many different things, using a number of different skills and talents.

____2.2. The job is significant and important.

____2.3. The job involves doing a "whole" and identifiable piece of work. That is the job now has a more obvious beginning and end which makes it a complete piece of work.

____2.4. The job requires me to use a number of complex or high level skills.

____2.5. The job permits me to decide <u>on my own</u> how and when the work is done.

____2.6. Dealing with other people is an absolutely essential and crucial part of doing the job.

____2.7. Higher level managers make a greater number of decisions that should be made by lower level managers.

____2.8. The job requires compliance with many rules and procedures.

____2.9. I am satisfied with the kind of work I do in this job.

____2.10. I feel a large amount of pressure in performing my work tasks.

____2.11. Managers and co-workers provide me with almost constant "feedback" about how well I am doing.

PART THREE

Listed below are a number of statements which could be used to describe a job. You are to indicate whether you agree or disagree with each statement as a description of your job.

Write a letter in the blank beside each statement, based on the following scale:

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

********** **********

____3.1. The job requires me to use a large number of complex or higher level skills.

____3.2. This job is one where a lot of people can be affected by how well the work gets done.

____3.3. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.

____3.4. The tasks are hard and require a high skill level to perform.

____3.5. The job denies me any chance to use my personal initiative or judgment in carrying out the work.

____3.6. The job requires a large amount of cooperative work with other people.

____3.7. The tasks are easy, and they can be accomplished with little training or experience.

____3.8. The job is unbearable.

____3.9. The pressure to perform my job is great.

____3.10. Just doing the work required by the job provides many chances for me to figure out how well I am doing.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

****

____3.11. The job gives me considerable opportunities for independence and freedom in how I do the work.

____3.12. The supervisor and co-workers on this job almost never give me any feedback about how well I am doing my work.

____3.13. The job itself provides few clues about whether or not I am performing well.

____3.14. Higher level managers make more of the decisions that should be made by lower level managers.

____3.15. The organization encourages creativity and minimal compliance with rules.

____3.16. I feel a lot of satisfaction about my job.

____3.17. There is little pressure to perform my job.

____3.18. Supervisors often let me know how well they think I am performing on the job.

____3.19. The tasks require little experience or training and are relatively easy.

____3.20. The job is simple and repetitive.

____3.21. The job is <u>not</u> significant or important in the broader scheme of things.

____3.22. The job provides me many chances to completely finish the pieces of work I begin.

____3.25. Lower level managers are allowed to make decisions that should be made by their supervisors.

PART FOUR

In this section, please write your responses in the space provided below each question.

4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

_____ _____ _____

_____

_____

_____

_____

_____

_____

4.2. Does WIMS provide the information needed for you to manage your branch/section? Please circle one.

Yes No

If not? How should it be changed?

_____

_____

_____

_____

_____

_____

4.3. List the five most significant contributions of WIMS.

1. _____

2. _____

3. _____

4. _____

5. _____

... List the five most negative aspects of WIMS.

1. _____

2. _____

3. _____

4. _____

5. _____

4.5. Please rate the implementation of WIMS into your unit by circling one of the following.

Unsatisfactory	Marginal	Satisfactory	Excellent	Outstanding

Please explain why you gave the implementation this rating.

_____

_____

_____

_____

_____

4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

_____

_____

_____

_____

_____

_____

_____

4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

Appendix E: Control Group Survey

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

1 MAY 1985

REPLY TO ATTN OF: LS (Lt Colman, AV 785-7212)

SUBJECT: Work Information Management System (WIMS) Impact Survey

TO:

1. Please take the time to complete the attached questionnaire, and return it to us in the enclosed envelope by 12 June 1985.

2. The survey measures your perceptions and attitudes toward the impact of the Work Information Management System (WIMS) on your job and job environment. The data we gather will become part of an AFIT research project which will be provided to the Air Force Engineering and Services Center to help them improve future implementation of WIMS technology. Your individual responses will be combined with others and will not be attributed to you personally nor to your unit's location.

3. Your participation is completely voluntary, but we would certainly appreciate your help.

LARRY L. SMITH, Colonel, USAF
Dean
School of Systems and Logistics

2 Atch
1. Questionnaire
2. Return Envelope

USAF SCN 85-44

AIR FORCE - A GREAT WAY OF LIFE

WORK INFORMATION MANAGEMENT SYSTEM (WIMS) IMPACT SURVEY

PART I--BACKGROUND INFORMATION

For multiple choice questions, circle the appropriate response.

1. My current grade is _____.

   a. E-1 through E-4
   b. E-5 through E-6
   c. E-7 through E-9
   d. O-1 through O-2
   e. O-3
   f. O-4
   g. WG-1 through WG-3
   h. WG-4 through WG-5
   i. WG-6 through WG-7
   j. WG-8 through WG-9
   k. WG-10 through WG-11
   l. WG-12 and up
   m. Other _____ (specify)

2. I have _____ years of service (military and/or civil).

   a. 4 years or less
   b. 5 to 8 years
   c. 9 to 12 years
   d. 13 to 16 years
   e. 17 to 20 years
   f. 21 to 24 years
   g. 25 to 28 years
   h. 29 to 32 years
   i. over 32 years

3. My job title is _____.

   a. Chief Operations
   b. Deputy Chief Operations
   c. Chief Resources and Requirements
   d. Chief of Production Control
   e. Chief Logistics
   f. Superintendent
   g. Foreman
   h. Chief Planning
   i. Chief Requirements
   j. Other

4. My age is _____.

a. 20 or less
b. 21-25
c. 26-30
d. 31-35
e. 36-40
f. 41-45
g. 46-50
h. 51-55
i. 56-60
j. over 60

5. Education _____.

a. Non high school graduate
b. High school graduate or GED
c. Some college but no degree
d. Associate's degree
e. Bachelor's degree
f. Postgraduate classes but no degree
g. Master's degree

6. My experience with computers includes (mark as many as applicable) _____.

a. No experience
b. Some experience in school
c. I own a personal computer
d. Using Air Force computer systems (such as BEAMS)
e. Other (Please explain) _____

_____

PART TWO

These questions concern a list of job factors that may or may not describe aspects of your job. We ask you to give us an evaluation about each factor. The evaluation concerns your agreement with the following statements. Use the following scale to select your responses and write the letter in the blank beside each statement.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

****

____2.1. The job requires me to do a large variety of tasks involving a large number of different skills and talents.

____2.2. The job is significant and important.

____2.3. The job involves doing a "whole" and identifiable piece of work. That is the job now has a more obvious beginning and end which makes it a complete piece of work.

____2.4. The job requires me to use a number of complex or high level skills.

____2.5. The job permits me to decide <u>on my own</u> how and when the work is done.

____2.6. Dealing with other people is an absolutely essential and crucial part of doing the job.

____2.7. Higher level managers make a greater number of decisions that should be made by lower level managers.

____2.8. The job requires compliance with many rules and procedures.

____2.9. I am satisfied with the kind of work I do in this job.

____2.10. I feel a large amount of pressure in performing my work tasks.

____2.11. Managers and co-workers provide me with almost constant "feedback" about how well I am doing.

PART THREE

Listed below are a number of statements which could be used to describe a job. You are to indicate whether you agree or disagree with each statement as a description of your job.

Write a letter in the blank beside each statement, based on the following scale:

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

****

____3.1. The job requires me to use a large number of complex or higher level skills.

____3.2. This job is one where a lot of people can be affected by how well the work gets done.

____3.3. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.

____3.4. The tasks are hard and require a high skill level to perform.

____3.5. The job denies me any chance to use my personal initiative or judgment in carrying out the work.

____3.6. The job requires a large amount of cooperative work with other people.

____3.7. The tasks are easy, and they can be accomplished with little training or experience.

____3.8. The job is unbearable.

____3.9. The pressure to perform my job is great.

____3.10. Just doing the work required by the job provides many chances for me to figure out how well I am doing.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F	G

****

____3.11. The job gives me considerable opportunities for independence and freedom in how I do the work.

____3.12. The supervisor and co-workers on this job almost never give me any feedback about how well I am doing my work.

____3.13. The job itself provides few clues about whether or not I am performing well.

____3.14. Higher level managers make more of the decisions that should be made by lower level managers.

____3.15. The organization encourages creativity and minimal compliance with rules.

____3.16. I feel a lot of satisfaction about my job.

____3.17. There is little pressure to perform my job.

____3.18. Supervisors often let me know how well they think I am performing on the job.

____3.19. The tasks require little experience or training and are relatively easy.

____3.20. The job is simple and repetitive.

____3.21. The job is <u>not</u> significant or important in the broader scheme of things.

____3.22. The job provides me many chances to completely finish the pieces of work I begin.

____3.25. Lower level managers are allowed to make decisions that should be made by their supervisors.

PART FOUR

In this section, please write your responses in the space provided below each question. This section is attempting to obtain your perceptions of the impact of the Work Information Management System (WIMS), a computer system that is projected to be implemented into civil engineering organizations.

4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

_____

_____

_____

_____

_____

_____

4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? *Please circle one.*

Yes No

If not? What information will not be provided?

_____

_____

_____

_____

_____

_____

4.3. List what you perceive will be the five most significant contributions of WIMS.

1. _____

2. _____

3. _____

4. _____

5. _____

4.4. List what you perceive will be the five most negative aspects of WIMS.

1. _____

2. _____

3. _____

4. _____

5. _____

4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

_____

_____

_____

_____

_____

_____

_____

Appendix F: Survey Data

Column	Data Element
1	Base Designator
2,3	Position Title Number
4	Grade
5	Years of Service
6	Job Title
7	Age
8	Education
9-12	Experience with computers
13	Time worked on WIMS
14	Frequency of using WIMS
15-18	Average time of task on WIMS
19	Question 2.1
20	" 2.2
21	" 2.3
22	" 2.4
23	" 2.5
24	" 2.6
25	" 2.7
26	" 2.8
27	" 2.9
28	" 2.10
29	" 2.11
30	" 3.1
31	" 3.2
32	" 3.3
33	" 3.4
34	" 3.5
35	" 3.6
36	" 3.7
37	" 3.8
38	" 3.9
39	" 3.10
40	" 3.11
41	" 3.12
42	" 3.13
43	" 3.14
44	" 3.15
45	" 3.16
46	" 3.17
47	" 3.18
48	" 3.19
49	" 3.20
50	" 3.21
51	" 3.22
52	" 3.25

```
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F26JBGHCA          GGDFGFBEGDCGGBFAFAADFGCBBAGBCAAAFB
F04BEDECCD         GGGGGGGGGGEGGEGBGBGGFCEEFFGGCBEAGG
G15CEGECA          EFFEFGGFGEFFFEBBFBBBFFBEFBFFFCCAGB
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J23BDGECB          GFBDAGGFAGADDCDEGCFFBACDGBAABCCBCB
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D15CEGECD    CD4.OOFGFFEGEEFCFGGCCBGBACEFAEDFFGFCBAEC
D12BEGEBC    CA1.OOGGGGGGGGGGGGGAGAGACGGGAGGDCAGAAAGA
E15JGGGCA    AAO.OOFFFFEGBFFEFFFEFBFBACFDBBBBFCFBBBBB
H26CEGFCB          EEFFFFCEFDDDFDCBDBADDDBDBDFCDBBBBD
H09CEFEDC          FFFEEGCEFDCEFBCBBBBBFFBBBCEBFBBBFB
H07LGFGBD          GFFGFGEFFGEGFCFBGAEGFFCEEBEBCBBBEB
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H13BEGECA          FFFDDFFFFDFDECDDEDCCEECCCCEEECDCEE
H08CFFFDD          FFFFCFGFFBAFGGFBFBAEEDAAGCFCABABBE
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E04MGDHDA    EE0.25GGDFEGDEEEAFFFFBFABEEEFDDBCAAAAACD
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A23KHGHBD   FF0.25GGFGCGBGGFFGGAFAGAACGGBACAGBFAAAGC
A06MHHGCDE  EE0.50GGFGEGGGEGEGGEGEFACFFFEBGBGBEABAFB
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I21BDGDCA         FF EFFFFEFFFFEECFBCFEEBCFEEEEBBBBE
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C21JFGFDC   GF0.00GGFGEGDGFBDGGAFAGAABGEDABAGEDABAGB
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F27HIGHCD         FGGGGGEGGEGEGBBBFAACDDAADBGEGAAADB
F21JIGHBB         FFFFGFDEGEDFGBFBFBDEEEDBDBFBBBBBFD
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D09CFFFCCD  DD0.25FFFFFGBFFBGBGBBBFBBFFFBBBBFFFBFBFF
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C20LHJGCD   GD0.25GGFFFGGGFGDFGDFCGABGGBBAGAFABAAACB
F25CDJDCA         FGEFEFFFFGFFFEEBGBAFFEDFDDGBBBCADC
I19BDGDCA         FFFFFFFFFFFFFBBBFBCEEECCFFEBBBBBBF
B14JGGHBA   DA0.50GFFFFGFFFFGFGAFAGBAEBFBFBFGBFBBBFB
I06MEHJCCDE       FFFFFGCFFFFFFBFBGABEEFBBCBFAEBBBED
B05MBEDCD   AA0.00GGGGGGGGGGEFGGDGBGAAFFFBBBDFBFAAAFD
H20KIGJBD         GGGFFGGGGFGGGGFAFCBAFFAAGBGCFCDAGD
E18BCGCDB   EC0.25FFEEFGDFFEEEFGEBFBBEEFBCDCECEBBBCE
J15JFGGBA         FDDDDGDFFEEDFDEBGAADEDBBADDDEAAADD
J16CFJEBC         DFFEFGFDBDFEGFEBGABDFEABFBFDDAAAFB
F23KIGHBA         GGFGFGCGGFFGGBFAGAAFFFBBBBFBEABAFB
F08CGFGCAD        GGFGEGGGGGEGGFGAGAAFGFBBGAGDFAAABB
J25BDGDCA         GFFEFGDGFFCFFEEDGAEGFEFBEDEAAAAAED
J18AAGBBD         FGGFFGBGGGEFGBEAGABGFFCBBAGAEAAAGE
E25CDGDCA   AA0.00FFDEFGEFFEEEEEDEGCCBEFBBDCECDBBBED
F24JCGGCC         FFFFEFCFFCFFFBEBFBBBFFBFBBFFFBBBFB
F03DAIBEBD        GFFEFGFFFEEEGBBAFBABFFBBECFBECAABF
G25JFGGCDE        FFGFGGCGGDEDGCDBGCAFEGCACAGBEDDCED
G10CDFDCDE        FGFFFGFFFDDFFDFBFADDEDCCFBFBDBBBFD
F12CDGDDA         GEECAFGEAFCCECBFECCEEACEFAAACCCCCA
F20KIGHBD         FFFGFGFEFGFGFBFBFBBFEFBEECFBFBBAFB
C18BDGDCA   AA2.50EGEFAGGEGEEGGGEAGEAAGEFABBCFFBBBFF
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Appendix G: Open-Ended Responses

The responses were separated by position title and then each question was separated into two groups. The first group contains the responses from locations that have implemented WIMS and the second group contains the responses from locations that have not yet implemented WIMS. The responses from the locations that have implemented WIMS will be designated with a "W" before the question number (i.e., W4.1.). The responses from the locations that have not implemented WIMS will be designated with a "N" before the question number (i.e., N4.1.). All responses have been transcribed onto this appendix as found on the surveys; no corrections were made to the open-ended responses in regards to spelling and grammar.

Chief of Operations

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Greatly increased visibility of work in CE system.
Provides more real time data than BEAMS.
User friendly.
Comprehensive in allowing analysis of J/Os as well as W/Os.
Paper reduction.

b. Allowed subordinates more freedom in job order management and has helped us give better customer support.

c. Scheduling/coordinating multi-shop work.

d. Control of work requests, job order etc.
Cost of work.
Planning jobs.

e. Time accounting.
Work order and job order tracking.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. I don't know enough about WIMS to answer any questions.

b. Supervisors having realtime data on any W/O or J/O in the system. This will have a positive impact because the supervisor can anticipate problems and correct them before the crews are on site.

c. No response.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? Please circle one. If not? How should it be changed?

a. Yes

b. No - We are only partially implemented as we only have 21 remotes and only partial software on line.

c. Yes

d. No - It doesn't help manage to control people only jobs. Needs to be more flexible in job orders with multiple shops. When you have a system (partial) already installed (Wang) you needd to be able to add to it more easily. We now have to rejustify additions.

e. No - For the most part it does. Some checks need to be in the system to keep minor construction work orders from being closed out until real property records have been updated as well as the as-built drawings.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? Please circle one. If not? What information will not be provided?

a. No response

b. Yes

c. No response

W4.3. List the five most significant contributions of WIMS.

a. (1) J/O data visibility
(2) Real time data is available
(3) Paper work reduction
(4) Eliminates lost records
(5) Information flow/coordination greatly expedited.

b. (1) Improved job order management
(2) Improved planner effectiveness and speed
(3) Reduced requirement for controllers
(4) Improved customer response time on jobs
(5) More effective weekly schedule

c. (1) Organization of material
(2) Availability of material
(3) Time savings
(4) Response to questions
(5) Complete record of work in the system

d. (1) Better control of jobs
(2) Reduction of paperwork
(3) Good response time

e. (1) Improved W/O and J/O tracking
(2) Improved time accounting
(3) Made possible "CEMAS" for material control
(4) Made possible "QUICK" reports for almost any need
(5) Broadcasts to all users can be quickly and accurately disseminated

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. (1) Real time data
(2) Wide use of computer
(3) Status available at all levels of supervision
(4) Quick turn-around on closeouts, updates, changes, etc.

c. No response

W4.4. List the five most negative aspects of WIMS.

a. (1) Does not include CEMAS addition. . needs IWP module so we can do real time IWP analysis versus next day BEAMS approach
(2) Not currently installed to all needed users
(3) Does not allow transfer between shops of J/Os without problems
(4) Can produce information overload if not used SMARTLY
(5) If not controlled, will allow several critical decision points to be by-passed, thus, service call clerk can make BCE level decisions and obligate CE to action

b. (1) Other than we are not fully implemented, positives far outweigh any small negatives

c. (1) Transition
(2) Resistance to change
(3) Learning the system
(4) Using the system
(5) Power failures

d. (1) Hard to get more terminals and printers
(2) Limited availability
(3) Poor training - much larger capability than most are aware of

e. (1) Lack of available training
(2) Lack of back-ups when system goes down
(3) Added workload to some individuals
(4) Lack of acceptance by some personnel
(5) Information only as good as untrained personnel input

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. (1) No training scheduled for users
(2) No one knows what's going on at base level

c. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Ranges from unsatisfactory to outstanding) Please explain why you gave the implementation this rating.

a. Outstanding - We wanted it badly, saw the obvious benefits before we received, it has delivered more than promised. Need more efforts like WIMS to help the poor base level CE.

b. Outstanding - Went very smoothly primarily becuase of adequate advance planning and a good implementation team.

c. Excellent - People were gradually trained and the transition was done in such as way that the imapct on operations was minimal.

d. Marginal to Satisfactory - I wasn't here for implementation but so far so good. It is not really

complete until it is all in. The prospect of peace mealing this implementation is antiproductive. The LMers make it too hard to add to what you have.

e. Satisfactory - Well organized but only limited training given.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes - Provide much greater visibility of information, allows over-the-phone analysis/coordination by multiple users who can simultaneously view the information, reduced paperwork tremendously and lost records.

b. Has put shop supervisor into job order management. Scheduling is his responsibility.

c. Yes - Knowing that a large volume of information is readily available leads to more requests (for information in the system). Enables supervisors, commander, etc. to be more prepared to deal with senior officers.

d. No response

e. Yes - Errors input by some sections can only be corrected by certain individuals due to access rights.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. Yes - Each shop could see the updated status on each W/O or J/O which could influence their ability to get work out.

c. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Great

b. For me it is a management tool and allows me to monitor branch performance through canned reports or inquiries. Since it is user friendly you can ask and get what you want and with a good system manager canned reports or statistics can be made easily available.

c. Performance is improving due to WIMS. Work is now properly tracked thru completion which means customers are happy. Shops have a clearer picture of work in the backlog and can better schedule worker hours.

d. Could be good impact when its done.

e. It has enhanced my performance to the point that I can find many answers to critical questions without wasting time manually checking status.

Deputy Chief of Operations

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. The automated service call/job order has had the greatest impact on this organization, in that the true backlog of job orders for each cost center by catagory can be retrieved allowing the forman to better manage his manpower resources to minimize the number of overdue requirements and allow him to challenge his shop to perform better.

b. Several areas in the Operations Branch were impacted by WIMS. Specifically, many of Production Control's tasks have been simplified with the use of the automated job order and work order systems, as well as the scheduling system. In Planning, FEJE has significantly simplified the process of planning a Work Order. However, the one area which impacted performance most was probably labor reporting. WIMS took this very labor intensive effort and completely automated it.

c. Work order and job order tracking planning section, ATA reports delinquents - scheduling

d. Less paper work. Better and more accurate tracking.

N4.1. What factors do you perceive will be impacted the

most by WIMS and which ones will impact performance the most?

a. I am not familiar with WIMS.

b. No information received on WIMS so I can not respond to this part of the survey.

c. No response

d. The immediate availability and accessability of all information for performance of operational functions.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? Please circle one. If not? How should it be changed?

a. Yes

b. Yes

c. Yes

d. Yes - However, not all inclusive. Need additional terminals, and software.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. What is WIMS

b. No response

c. Yes

d. Yes

W4.3. List the five most significant contributions of WIMS.

a. (1) Job order backlog management and tracking
(2) Work order status and tracking
(3) Material requirements and tracking (CEMAS)
(4) Facility survey scheduling/accomplishments/ programming for future
(5) Labor reporting and scheduling

b. (1) Labor reporting system
(2) Automation of job orders
(3) Automation of work orders/work requests
(4) Automation of the planning process

(5) Scheduling system

c. (1) Tracking work order
(2) Tracking job orders
(3) ATA
(4) Scheduling
(5) Info for commanders update

d. (1) Less paperwork
(2) Faster handling work orders
(3) Accurate and complete accounting
(4) Faster recall of history & files
(5) Word processor capabilities

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. Don't know

b. No response

c. No response

d. There has not been enough published information about WIMS to intelligently answer these questions.

W4.4. List the five most negative aspects of WIMS.

a. (1) Not enough work stations and printers available
(2) Haveing to update BEAMS and WIMS in some cases
(3) Initial shock of using a computer for day to day business
(4) Instruction and training should be expanded
(5) Number of printers is a big problem here

b. (1) Limited disk storage capability
(2) Limited access to terminals

c. (1) Not enough space
(2) Not enough CRT work stations
(3) Need some new programs

d. (1) Down time
(2) Not wide enough spread throughout an org.
(3) Not enough programs included

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. Don't know

b. No response

c. No response

d. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Ranges from unsatisfactory to outstanding) Please explain why you gave the implemntation this rating.

a. Marginal - This base has yet to have a full blown implementation - most of the prototyping was accomplished here and programs were made operational and problems corrected as they arose. Implementation and one-on-one training is needed.

b. Satisfactory - The I/C Team was in and out so fast there were a lot of unanswered questions. We had a lot of unexpected equipment problems that the I/C Team could not handle. Also, after the I/C Team left, we found that in many cases, the programs were designed and written for Tinker AFB. We need to do some modifying to use them here.

c. Excellent - The manual tracking system is far to cumbersome.

d. Excellent - It has overall helped with backlog and allows needed information instant recall. Saves time, more accurate, everyone reads from the same music.

W4.6 Has the introduction of WIMS increased the ability of an indiviual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes - both in the area of job orders & work orders the scheduling these requirements as they are introduced into the system and flow through the system to completion. Work orders & job orders as they become supportable are immediately shown on the appropriate cost center's backlog for scheduling or accomplishment.

b. I would say it most definitely has. Now when we get a letter from a customer complaining about the service CE is (or is not) providing, we can run

inquiries against different variables (including the facility or requestor) and in minutes (instead of hours or days) get supporting data to prove or disprove the customer's claims.

c. Production control section influence and ability to turn out good info has doubled.

d. In the beginning it did influence the behavior of workers as any new tool would, but seems to be taken more for granite latley.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization does buisiness.

a. Don't know

b. No response

c. No response

d. No response

N4.7 Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Increased visiability of backlogged requirements and short falls in materials/manpower/and money to support the work laod. Increased visiabity of non-performance of RMP requirements resulting in increase of service calls for these systems.

b. WIMS has enabled me to more effectively manage my Branch. This is due in large part to the data base we have at our fingertips. Current information can be gathered in minutes and presented in a form that makes decision making process fast and as accurate as it can be.

c. Quick answers to all of work force productivity.

d. A good tool, we feel we are getting in to the main stream of modern technology.

Chief Resources and Requirements or Chief or Requirements

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Access to more information in BEAMS files was available but difficult to get. More control over what is going on and who is allowed to do what. Better tracking and status. Speed.

b. The most significant factor is the savings of time for me in checking status of work (e.g., work orders, job orders, scheduels, IWP, etc.).

c. WIMS is a new system with no training aids. Personnel have no idea how to otherwise work the system. The end result is that many workers continue to keep manual tracking systems and the computer data is not accurate.

d. Problem analysis and trend analysis were radically improved. As a result weak areas in shop perfomance and management become very obvious and trackable.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. Hopefully WIMS will provide better inter-branch communications (access to files, etc.). This should be a positive impact.

b. Job order & work order processing and tracking.

c. If updated correctly, it will provide information faster and allow us to review trend information that take a long time to manually calculate.

d. (1) Real time data/up to date status
(2) Availability
(3) Increased use
Most important is real time data.

W4.2. Does WIMS provide the information need for you to manage your branch/ section? If not? How should it be changed?

a. Yes

b. Yes

c. No - The data base must be accurate before any use as a tool can be attempted.

d. Yes

N4.2. Do you think WIMS will provide the information needed you to manage your branch/section? If not? What information should be provided?

a. Yes

b. Yes

c. Yes

d. Yes - I hope!

W4.3. List the five most significant contributions of WIMS.

a. (1). More accurate time accounting is possible and faster
(2). Planning is more accurate
(3). Increased access to information of all types
(4). Research and cross references are easier
(5). Speed

b. (1). Time savings
(2). Variety of information
(3). Ease of consolidation of data
(4). Ease of use
(5). Availability of reports

c. (1). Access to data
(2). Formation of reports
(3). Speed of data retrieval; delinquent J.O. reports, etc.
(4). Word processor ability
(5). Accessability for workers

d. (1). Speed
(2). Data analysis
(3). Centralized information files
(4). Accountability
(5). Labor reporting improvements

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1). Managers should be better informed about the other branches.
I do not know enough about WIMS to intelligently list any other advantages/disadvantages.

b. (1). Automation of SC & CSU function
(2). Automation of planning

(3). Automation of MAT control
(4). Quick follow-up on status

c. No response

d. (1). Real time data
(2). Increased availability
(3). Increased use (more personnel using system)
(4). All levels of supv. actively involved
(5). Better hardware & software

W4.4. List the five most negative aspects of WIMS.

a. (1). Inability to charge time in more than 1 shop or a job order at a time
(2). Interface with BEAMS is clumsy. Direct transfer would be more accurate
(3). Report utility is limited. Most do 2 reports when 1 could do the job

b. (1). Inaccurate data (perpetuates more inaccurate data)
(2). BEAMS - WIMS interface is often a problem

c. (1). Inaccurate data files
(2). BEAMS overlay procedure
(3). Data is continuously changing (no duplicating reports)
(4). Inability for staff to program in familiar language (Fortran IV)
(5). Lack of training

d. (1). Lack of visual aids & quick references
(2). Lack of chart making ability from data analysis
(3). Lack of coordination with supply and procurement offices
(4). A lack of terminals at each workstation

N4.4. list what you perceive will be the five most negative aspects of WIMS.

a. (1). Transition from/correlation with BEAMS

b. (1). Too much reliance on computer system
(2). Computer goes down - out of business
(3). Not good for readiness!

c. No response

d. (1). Lack of training/familiarization
(2). Lag time in obtaining the system

(3). Support required to install hardware

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. Please explain why you gave the implementation this rating.

a. Marginal - Poor documentation, training was not coordinated so that it fit the way this unit does business. Programmers were not receptive to the needs, wants of the base. Constant changes in what programs would be implementated made it difficult to plan equipment locations. Changes/improvements to software not made available to unit once system is implemented at that location.

b. I was not here when WIMS was implemented.

c. Marginal - WIMS has caused personnel to believe that AF procedures no longer exist. Work is done with half the procedures of AFR 85-1 and half thus made up by individuals.

d. Satisfactory - We need more terminals! When you convert a shop to WIMS, you cannot go only half way. People are idle waiting for free terminals in order to do their jobs.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes, material information is more readily available. Operation is more streamlined allowing shops to be more responsive.

b. The increased availability of info at the BCE and DEM levels often creates undo convern at their levels of "small" problems.

c. WIMS has resulted in gross confusion throughout the operation branch. Some sections use it, some don't.

d. Little to no impact in this area.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. This should not enable individuals/branches to influence others any more than what already exists.

b. No

c. No response

d. Real time data is the best for making decisions.

W4.7. Please describe the success of WIMS in terms of its impact it had on your performance.

a. Make management decisions almost on the spot because the necessary information is at my fingertips. Also, contact with customers is easier since the information is there.

b. I feel WIMS has made my job more efficient. I no longer must depend on others for much of the info I need to do my job or make decisions.

c. Personnally, I find it difficult to perform my duties with the WIMS data base inaccurate. Howev r, I find the computer system a great tool when the information is valid.

d. Service to the customer is better. Average work order age is decreasing while the step by step process of performing a requirement is moving faster.

Chief of Production Control

W4.1. What factor were impacted the most by wims and which ones imnpacted performance the most?

a. (1). We eliminated all of the manual files and log books.
(2). We have the ability to cross reference files to locate job orders for customers (quicker).
(3). Saves time taking job orders over telephone.

b. Labor reporting (we've eleminated 1 controller). Work order planning (we now have 100% EPS compliance). Information retreivel (we can now identify easier a WR/SO/JO with a building number & time frame).

c. Unknown

d. Elimination of manual logging, tracking of work requirements, writing of W/O's - J/O's computer prints. Employees feel tied to the computer, not enough remote units to be readly available to all. Excessive down time of computer. Problems of tracking, writing work requirements during down periods. BEAMS update of WIMS not responsive enough.

e. Duplication of job orders - job order tracking & counting. Job order tracking impacted performance the most.

N4.1. What factors do you percieve will be impacted the most by WIMS and which ones will impact performance the most?

a. Cannot comment on items 4.1 - 4.6. Only have basic idea of what WIMS is all about. This system has never been briefed or explained.

b. No response

c. No response

d. System down time and unable to inquire or retrieve information.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes - Change - no. Improve - yes. WIMS does not track material costs on job orders. Recommend interfacing BEAMS material files with WIMS to get MAT costs.

b. No - We could use a modification to the Planning Unit performance reports distinguishing between work requests and work orders.

c. Yes

d. Yes & No - Does provide info. needs to be more responsible.

e. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. Yes

c. No response

d. Yes

W4.3. List the five most significant contributions of WIMS.

a. (1). Eliminated manual files and logs.
(2). User friendly, easy to get reports.
(3). Saves manpower.
(4). Quick responses for customer questions.
(5). The system is capable of expanding. Storage is now limiting this though.

b. (1). Direct automated labor reporting.
(2). Use of EPS in planning.
(3). Information retrieval/availability.
(4). Locally designed IWP schedule compliance reports.
(5). Locally designed planning backlog report showing age distribution.

c. (1). Fast response.
(2). Clarity.
(3). Accuracy.
(4). Reduced filing need.

d. (1). Imediate identification of work requirement.

(2). Tracking capability from any remote.
(3). Identification of work by W/O nr., facility nr., organization.
(4). No manual preperation of paper work to prepare W/O.
(5). Availability of information.

e. (1). More accurate time accounting.
(2). Cut down on duplicate job orders.
(3). More accurate job count.
(4). Easier W/O processing.
(5). Easier material tracking.

N4.3. List what you percieve will be the five most significant contributions of WIMS.

a. No response

b. (1). Less paper work.
(2). Phone call.
(3). Work control.
(4). Work to be accomplished in short time.

c. No response

d. (1). Better control of job orders.
(2). Immediate information at your request.
(3). Keeping customers better informed.
(4). Accurate information data for reports.
(5). Expedious collecting and inputting information into the WIMS and better understood.

W4.4. List the five most negative aspects of WIMS.

a. (1). It interfaces only marginally with BEAMS.
(2). Work can too easily be closed accidentially (JOs especially).
(3). Difficult to check duplication in service call.
(4). On the WO side it duplicates BEAMS in some cases.
(5). Our system has very limited storage capabilities.

b. (1). Lack of terminals & modems (6 mi distant planning sub/unit).
(2). Lack of disk space (No word processing, MAL, W/G, list).
(3). Redundancy (still using AF Form 332 and WIMS records).

c. (1). No permanent memory storage for WO reports.

(2). Slow response time.
(3). Lack of description space.
(4). Cheap hardware, is wearing out after year's use.

d. (1). Down time of computer.
(2). Lack of sufficient terminals.
(3). Loss of or delays of tapes for update.
(4). Frustration of need to work 2 systems, BEAMS, WIMS.
(5). No means of WIMS update to BEAMS.

e. (1). Need more computer space.
Totally satisfied with the entire system.

N4.4. List what you percievewill be the five most negative aspects of WIMS.

a. No response

b. N/A

c. No response

d. (1). System failure, crippling information retrieval.

W4.5. Please rate the implementatin of WIMS into your unit by circling one of the following. Please explain why you gave the implementation this rating.

a. Excellent - See items 1 & 5 of #4.4.

b. Excellent - It's brought CE operations information management out of the stone age.

c. Satisfactory - Despite negative aspects the WIMS system has speeded up action and reaction time.

d. Marginal - See above

e. Excellent - More detail training in some areas would be helpful. Example - controller - material control.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Marginally. By using WIMS & BEAMS in combination

we are able to isolate problems and direct corrective action to units creating the problem.

b. More data (epecally back-log) is being retrieved by the Operations Chief.

c. No doubt there is a positive impact here but no study has been made, consequently no in-depth evaluation (is at this time) is available.

d. No.

e. Yes.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. The WIMS will give the section a more education relationship with the other parts of CE.

c. Overall their will be no change in the quality of work performed by our skilled craftsman. However, it should be a tremendous influence on the administrative side of the house. Computerization is the key, a sense of hi-tech.

d. Don't have enough information on the WIMS to provide input.

W4.7. Please describe the success of WIMS in terms of the impact it had on your performance.

a. It has made my job easier. I've reduced my number of service call specialists and schedulers. Customer Service is normally able to give on-the-spot answers to customers. I am also to easily obtain management products on our work.

b. Except for limitations in disk space, modems, and terminals/printers which prevent/hamper DEE and a geographically separated planning sub-unit from using WIMS, we now handle our information quicker and easier.

c. None based on my performance as I rarely use the system.

d. None.

e. We can now provide more accurate information to our customers. Faster more accurate weekly work schedules.

Chief of Logistics

W4.1. What factors were impacted the most by WIMS and which ones imnpacted performance the most?

a. N/A

b. No response

N4.1. What factors do you percieve will be impacted the most by WIMS and which ones will impact performance the most?

a. I really don't know a lot about WIMS. I haven't had any exposure to it and I therefore can not answer the remaining questions.

b. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. N/A

b. No response

N4.2. Do you think WIMS will provied the information needed tofor you to manage your branch/ section? If not? What information will need to be provided?

a. No response

b. Yes

W4.3. List the five most significant contributions of WIMS.

a. N/A

b. No response

N4.3. List what you percieve will be the five most significant contributions of WIMS.

a. No response

b. No response

W4.4. List the five most negative aspects of WIMS.

a. N/A

b. No response

N4.4. List what you percieve will be the five most negative aspects of WIMS.

a. No response

b. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. Please explain why you gave the implementation this rating.

a. Have not used the system yet.

b. No response

W4.6. Has the introduction of WIMS increased the ability of any individual or section to influence the behavior of other individuals or sections?

a. No response

b. No response

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

W4.7. Please discribe the success of WIMS in terms of the impact it had on your performance.

a. No response

b. No response

Chief of Planning

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Legibility
Speed
Less paperwork
Fast work
Accurate work

b. Not required to keep a log of work orders and job orders. Automated facility survey schedule.

c. Faster, less chance of mistakes. Less paper work. Easy to track work orders, job orders, work requests. Better kept records.

N4.1. What factors do you percieve will be impacted the most by WIMS and which ones will impact pererformance the most?

a. No response

b. No response

c. No response

d. Unknown - No info on what the program (WIMS) will have.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. Yes

c. Yes & No - Facility inspections & built up roof history should be included. We have remote sites. When we call up a facility, we don't know at what site.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes

b. No response

c. No response

d. Yes & No - Unknown - I don't know what or how much information is or will be program in (WIMS).

W4.3. List the five most significant contributions of WIMS.

a. (1). Provides an overview of current workload/backlog.
(2). A capability to obtain rapid status.
(3). A excellent management tool.
(4). Reduces paperwork/a lot of handwriting.
(5). More professional, ledgeble end product.

b. (1). Planning schedule.
(2). Facility survey schedule.
(3). List of job orders by planner assigned.
(4). Lists of work orders/request by planner.

c. (1). Faster for me & planning tech.
(2). Saves paper work.
(3). AFM 85 series on software.
(4). Can plan electronically.
(5). Can assign work to planners Y track.

N4.3. List what you percieve will be the five most significant contributions of WIMS.

a. (1). Will allow us to program CE business.
(2). Faster recall time because of less traffic.
(3). Will allow input of self generated programs.
(4). Less down time - I hope.
(5). State of the art computer.

b. No response

c. No response

d. 1. Unknown

W4.4. List the five most negative aspects of WIMS.

a. (1). Lack of terminals.
(2). Lack of all programs.
(3). Some source data inadequate.

b. (1). Problem with multi shop job orders.
(2). Job order cannot be phased in planning.
(3). Planning schedule should be changed to allow posting note complete.

c. (1). When it goes down, we are out of business.
(2). Can not order material 1445's.
(3). Does not have fac. insp. included.

N4.4. List what you percieve will be the five most negative aspects of WIMS.

a. (1). Lag time in transferring programs.
(2). Possible difficulties in interfacing self developed programs.
(3). Training time.

b. No response

c. No response

d. (1). Unknown

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. Please exlain why you gave the implementation this rating.

a. Excellent - A marvelous administrative tool for planners.

b. Excellent - All sections accomplished input and coordinated with each unit on location of work items.

c. Excellent - Still has some bugs in the system.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Believe it arranges the though process when phasing and tasks are concerned. One can visually review and change when necessary.

b. Gives up to date formation if each unit will monitor their listing and make sure that items are transferred in accordance with those changed in computer.

c. It has helped our section. We have reduced back log by 75%. However, we do not have enough terminals. Some planners are waiting their turn to get logged on. Our effeciency has peaked out.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. I feel WIMS will make communication within CE easier, because we will be able to get printouts on everything going on in CE. We will won't we?

b. No response

c. No response

d. Not for planning.

W4.7. Please discribe the success of WIMS in terms of the impact it had on your performance.

a. On a scale of 1 to 10 I would rate performance on or about a 7.

b. Less time spent in hand writing job phase sheets. Some planners need more training on use of computer. Most planning except for field work and material lists stops if computer is down. However, we have not experienced very much down time.

c. It is a fast effective tool for ready reference. History fast recall, and good record keeping. It is saving our section time and paper.

Mechanical Superintendent

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Much easier to total & review daily labor. With WIMS controller can close out previous day in about 50 minutes. Averaged two hours with 1734.

b. Ability to supervise. Reports available and ready answers reduce time spent chekcing schedules, work awaiting scheduling and any delinquents. Better labor time accounting.

N4.1. What factors do you percieve will be impacted the most by WIMS and which ones will impact performance the most?

a. No response

b. 1. Increase productivity of the work force.
2. Accurate and timely decision (effectiveness) as a result of instant information.
3. Increase effectiveness of the service call function.
4. Better management of the recurring maintenance program.
5. Eliminate the need for storing information in file cabinets, information can be stored on disks.

c. Unk

d. WIMS will impact the most on paper flow. It will decrease the amount of lost parts and increase accountability of all parts, paper work and increase productivity.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No - Desperately need multi-shop job orders. Have counter for job orders needs to go higher than 99. Do not have access to all info needed (local problem). Superintendents need a terminal they can use; presently have to interrupt controller for terminal.

b. Yes & No - Need to be able to put multiple shops on job orders. Should take more than 3 shops before a job order is closed & another opended for the same job.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. No response

c. No response

d. No response

W4.3. List the five most significant contributions of WIMS.

a. 1. Easy recall of buildings with problems areas.
2. Readily gives back-up data.
3. Easier to balance daily labor.
4. Much easier to track customer complaints.
5. If used properly, controls delinquents much better and more timely.

b. 1. Instant answers to questions.
2. Better reports.
3. Reduced scheduling problems.
4. Better time accounting.
5. Easier job order transfer.

N4.3. List what you percieve will be the five most significant contributions of WIMS.

a. No response

b. 1. Eliminate the need for maintaining huge paper files.
2. Give decision maker access to instant information.
3. Reduce personnel costs by reducing jobs.
4. Increase work force productivity.
5. Enhance communication.

c. Unk

d. 1. Increased productivity.
2. Decreased paper work.
3. System manageability.
4. Controllers able to control.
5. Parts/J/O - W/O controlability.

W4.4. List the five most negative aspects of WIMS.

a. 1. When computer goes down, controllers are at a stand still.
2. CRT's are hard on back and eyes.

3. Some material gets erased or blown off system for unknown reasons.
4. When inputting corrections to labor, sometimes the summary then won't balance.
5. Labor hour counter needs to go higher.

b. 1. Not enough terminals.
2. Multiple shops can not be put on 1 job order.
3. Only 3 transfers can be made per job order.

N4.4. List what you percieve will be the five most negative aspects of WIMS.

a. No response .

b. 1. Elimination of jobs.
2. Computer malfunctioning and breakdowns.
3. Shortage of personnel qualified to operate the computer.
4. Misuse of the system and an invasion of personal privacy.
5. Overly dependent on the WIMS.

c. Unk

d. None

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following.

a. Satisfactory - It is a good system that has excellent potential for improving the CE functions. However, changes, updating, software, and terminals are far behind.

b. Satisfactory - It was done in a timely manner and instructions were good.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into the decisions or dictating how the organization conducts business.

a. It is much easier to tell if you are receiving lateral support.

b. Yes - Mostly through speed and job order transfers to other controllers. Inputs from the CSU and SVC are faster.

N4.6. Do you feel WIMS will increase the ability on an

individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. Yes

c. Unk

d. No - Each section will be able to know how they stand by reviewing the list of emergency urgent and routine job orders - superintendents will have more control and be able to interface with other sections.

W4.7. Please discribe the sucess of WIMS in terms of the impact it had on your performance.

a. Many reports are easily retrieved if superintendents had a terminal.

b. I can better watch job orders and progress. Gives me ready access to answer customer questions. Gives me a little more time on job sites away from the office.

Structural Superintendent

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Work force control, work control, and accountability were impacted the most by WIMS. Work force control impacted performance the most.

b. I am not familiar with WIMS.

c. It increased the speed of paperwork. It also provides instant recall of all past work completed.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. (1) Time saving, (2) Reduce the paperwork load, (3) Increased accountibility.

b. Total system is better than present system.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changes?

a. Yes

b. N/A

c. Yes - However there should be an interface developed between WIMS and CEMAS.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes

b. Yes

W4.3. List the five most significant contributions of WIMS.

a. (1) Work force control
(2) Work control
(3) Labor accountability
(4) Paper work
(5) Productivity

b. N/A

c. (1) Increase speed of paperwork
(2) Instant recall of past work
(3) Easy to research the history by facility
(4) Excellent 561, updated daily
(5) Easy to duplicate last paperwork

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) Speed
(2) Accessible to more information
(3) Updated information
(4) Reduce written reports

b. (1) Material status
(2) Scheduling
(3) Tracking job orders
(4) Figuring IWP
(5) Location of craftsmen

W4.4. List the five most negative aspects of WIMS.

a. No response

b. N/A

c. None

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. (1) Job lose
(2) Resistance to change
(3) Fear of making mistakes

b. None (Except a direct link with the BCE)

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Excellent - The implementation was well planned in advance, training was good and the cross over from manual to WIMS was smooth.

b. N/A

c. Excellent - It has improved the management of paperwork.

W4.6. Has the introduction of WIMS increased the ability of

an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Speed by which information can be available has influence many, supervisors, workers, and the customers.

b. N/A

c. No

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes - Improve decision making process. (NOTE: More information on WIMS is needed by mid-managers; most have very limited knowledge of this system.)

b. Yes (You said it all.)

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Productivity has increased because of the availability of information when needed.

b. N/A

c. All the necessary information is readily available, when needed.

Pavements and Ground Superintendent

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

b. Work force control was impacted in a positive manner due to the immediate availability of necessary information and less paper work is required.

c. The quick reference of recalling a job orders to check their stats.

N4.1. What factors do you perceive will be impacted the

most by WIMS and which ones will impact performance the most?

a. I have not been briefed on the WIMS program.

b. I do not know enough about the system to provide good feedback.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. Yes

c. Yes & No - With a back up system to recall the labor after it has been closed.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. No response

W4.3. List the five most significant contributions of WIMS.

a. (1) Research labor and man hours spent
(2) Research job sites
(3) Research job requestor
(4) Research future work orders
(5) Research lost J/O & work orders

b. (1) Faster
(2) Less writing
(3) Auto updating of labor summary
(4) Readily available information
(5) Enhances productivity

c. (1) Recalling pass job orders
(2) Imputting your labor for the day
(3) There's still a lot for both sides to learn

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. No response

W4.4. List the five most negative aspects of WIMS.

a. (1) Can't put more than three shops on a job order
(2) Can't do anything when computer is down
(3) Program defects

b. (1) No interface with BEAMS
(2) JOs immediately appear on delinquent list against shop after material supportable
(3) Inadequate space to totally describe job on delinquent listing

c. (1) The labor can't be recalled after closing
(2) We are still finding out new concepts of WIMS

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. No response

W4.5. Please rate the implementation of WIMS inot your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Satisfactory

b. Excellent - see item 4.3.

c. Excellent - Because there is an awful lot for both sides to learn about the system.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No

b. Yes, in a positive manner which has depicted a better overall picture and enhanced productivity.

c. I think, but the we use the system the more we are learning.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence coule be in terms

of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. It gives me ready access to job orders. I can look at a job order or work order to see how many man hours our shops have charged. With the other manual system I could not accomplish this.

b. It is a tool that has provided much better control and enhanced my performance.

c. The system is much faster with the results as the old system.

Electrical Superintendent

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Labor reporting and controllers functions were enhanced. Ordering materials became more difficult as post/post procedures weren't developed.

N4.1. What factors do you perceive will be impacted the most be WIMS and which ones will impact performance the most?

a. No response

b. I donnot have enough knowledge about WIMS to give responses.

c. I have not been thoroughly briefed about WIMS so I do not think I can comment on this.

d. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What

information will not be provided?

a. Yes

b. No response

c. Do not know

d. No response

W4.3. List the five most significant contributions of WIMS.

a. (1) Job order reviews
(2) Work order reviews
(3) Residual listings
(4) CEMAS store listings
(5) Broadcast messages

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. No response

c. Do not know

d. No response

W4.4. List the five most negative aspects of WIMS.

a. (1) Denied local access to job order system work order residual listings CEMAS RWP

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. No response

c. Do not know

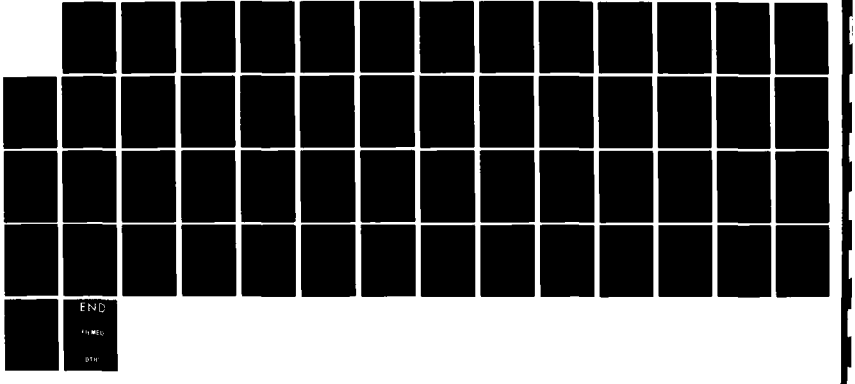
d. No response

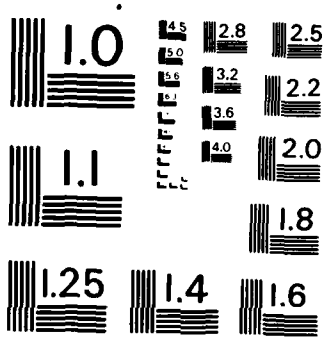
W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Unsatisfactory - Senior management could not get access to programs with their user ID or password.

AD-A160 939 AN ANALYSIS OF THE IMPACT OF THE WORK INFORMATION MANAGEMENT SYSTEM (WIMS..(U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST.. D P COLMAN 3/3

UNCLASSIFIED SEP 85 AFIT/GEM/LSM/85S-6 F/G 5/1 NL





W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Functions which were automated often times required numerous activities to coordinate unnecessarily. e.g. five activities had to call-up a job order and send it along before it finally arrived in material control even on emergency jobs. This could not be over ridden and was imposed by our WIMS programs office.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

c. Do not know

d. No response

W4.7. Please describe the success of WIMS ikn terms of the impact it has had on your performance.

a. Mainly that it has not lowered manpower requirements in our management overhead. This should be the goal of any successfull automation system.

Sanitation Superi tendent

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. RWP - especially DEMSE which must depend on mother nature - wind, rain, to perform many tasks - weed control, mosquito fogging, ect.

b. WIMS is a big help to the controllers and shop supervisors.

c. Tracking & data storage have impacted the operations the most. A permanate record of jobs orders and their completion is invaluable.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. I am not familiar enough with the system to know.

b. Do not know enough about the program to respond intellengently.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No - Info must be accurate - reliable.

b. Yes

c. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes

b. No response

W4.3. List the five most significant contributions of WIMS.

a. ?

b. (1) Helps controllers
(2) Helps superintendents
(3) Helps shop supervisors
(4) Helps branch chief
(5) Helps getting supplys

c. (1) Data collection
(2) JO tracking
(3) Personnel rosters
(4) Prime Beef recall system
(5) RMP

N4.3. List what you perceive will be the five most significant contributions of WIMS

a. I do not know

b. No response

W4.4. List the five most negative aspects of WIMS.

a. No response

b. N/A

c. (1) Management using WIMS as a negative instead of a positive.

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. I do not know

b. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Marginal - Inaccuracies

b. Satisfactory - We haven't worked with WIMS long enought to pinpoint the negative aspects. Everything thus far seems to be in our favor.

c. Excellent - Great management tool, takes alot off day to day management responsibilities.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Not in DEMS.

b. No comment

c. Yes, information on job orders can be transmitted quickly and easily thus making more efficient use of manpower.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. I do not know

b. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

b. Better control of personell. We have a good handle on job progression at all time.

c. Jobs get done quicker because supervisors have positive control over this work load.

Pavements Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. Do not know

b. I have no information on WIMS. I have not been briefed nor have I seen any regulations on WIMS.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No response

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. No response

W4.3. List the five most significant contributions of WIMS.

a. No response

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. Don't know

b. No response

W4.4. List the five most negative aspects of WIMS.

a. No response

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. Don't know

b. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. No response

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individual or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Don't know

b. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

Equipment Operations Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. I do not know enough about the WIMS to make any judgement about this statement.

b. Deletion of lost paperwork. A effective means of tracking old JO & WO.

c. Scheduling

d. WIMS is used as a file system. It dumps a lot of paper on the shops. Most of which ends up in the trash can. It could and should be used more as a tool.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. I'm a recent overseas returnee. I know nothing about WIMS. Will be doing research into the system.

b. I have no idea. I have not been briefed on what is expected to be obtained by this system.

c. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes - My controller can get the information I ask about most of the time.

b. Yes

c. No - But will become more efficient as time allows.

d. No - Now I am being asked on a daily basis why a job is in stoppage. It should be on any print out for all to see.

N4.2.Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. I don't know

c. Yes

W4.3. List the five most significant contributions of WIMS.

a. No response

b. (1) Less paperwork
(2) A permanent record of all JO & WO
(3) A file for individual equipment issue
(4) A record of work perform by each individual

c. (1) Time
(2) or availability of info

d. See Attachment -
"Once upon a time there was a little town, quite self-sufficient, and owned by a man. He was a kind man and ministered to the needs of the town's people. With the passage of time and the coming of automobiles, there developed a need for a garage - so

the kind man found a good mechanic and set him up in business. He told the mechanic, 'charge your customers $3.00 an hour for the work that you do. Give me $1.00 of the three dollars and you keep the other $2.00'. And so it was.

The little town prospered, and the garage prospered, and more time went by. Then, to keep pace with progress they decided that they needed to keep a better account of things, such as happenings, and costs, and incomes, and taxes, ad the things of a more modern age.

So accountants were hired, and from the information they gathered and from the instructions from their machines, they had to hire people to arrange the work for the garage, and schedule it for the mechanic, and, then they wondered how they ever got along without all these systems. By now the mechanic was hard pressed to perform all his chores. He had to furnish reports to the accountants and had to meet with the production controllers, and he complained. So, they hired engineers and specialists to help him improve his operations. They had operations on IBM cards, on machine reports, in schedulers notebooks, on inspectors scratch pads; and when it was all piled together, it was a impressive sight. They would tell which jobs were behind and by how much; how good everyone had guessed ahead of time; and what all might have happened, and a lot of which didn't.

And a lot more time went by, and the cost to the customer had now gone from $3.00 to $21.00 an hour, and the customers, who supplied the money complained. It was decided that costs must be cut.

So, there was a meeting, and all agreed that they must produce more with less, and the cost must be cut. They could not cut the $1.00 that went to the owner, and all the engineers were necessary. The production controllers and the iinspectors and the accountants were all necessary; yet, they must cut costs.

They did the only thing left to do. They fired the mechanic."

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. No idea

c. No response

W4.4. List the five most negative aspects of WIMS.

a. No response

b. No response

c. No comment

d. (1) Dose no interface with BEAMS

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. I don't know

c. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Excellent - I can recall information when I need it without lost time.

b. Satisfactory - This system is relatively new to our organization. I am sure when everyone gets use to it, it will be an outstanding system to perform everyday task.

c. Satisfactory - It accomplishes the task but will due better as time goes on.

d. Satisfactory

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. I feel it has helped a lot. With what I know about the system.

b. I don't think so.

c. No response

d. No

N4. . Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. I don't know

c. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. I cannot say what success it has had on my job the system was here when I took the job I have now.

b. None

c. Little impact on my performance.

d. None - Because it is used as a file not a management tool.

Grounds Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. N/A

b. In my operation had little impact.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. N/A

b. It has little bearing on the performance of my job.

W4.3. List the five most significant contributions of WIMS.

a. N/A

b. (1) Made controller job easier

W4.4. List the five most negative aspects of WIMS.

a. N/A

b. (1) Little effect one way or another

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementat'on this rating.

a. N/A

b. Satisfactory - Fear changes in my operation

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. N/A

b. It has make it easier for superior to pen point what one individual is assigned to on any given day.

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Still in experment sage.

b. I do not know know of any impact on my performance.

Structural (Carpentry) Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Of knowing where you stand at all times of job orders and weekly work schedule, so you can measure the projected to the actual. Gives an indication of how foreman are performing.

b. N/A

c. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the

most?

a. Higher level managers make a greater number of decisions that should be made by lower level managers The job provides me many chances to completely finish the pieces of work I begin. There is little pressure to perform my job. Supervisors often let me know how well they think I am performing on the job. The job is simple and repetitive.

b. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. N/A

c. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes

b. No

W4.3. List the five most significant contributions of WIMS.

a. (1) Daily deliquent & active J/O listing
(2) Daily work schedule
(3) Recall of J/O in history
(4) Material listing on print out sheet
(5) 251 product of what happened week before

b. N/A

c. (1) Listing of all job orders in system
(2) Listing of major work orders
(3) RWP
(4) Scheduling of work

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) Dealing with people is absolutely essential
(2) Higher level managers make a greater number of decisions that should be done by lower level
(3) I'm satisfied with the kind of work I do in

this job
(4) Managers and co-workers provide me with almost constant "feedback" about how well I am doing.
(5) The job gives me considerable opportunities for independence and freedom in how I do the work.

b. No response

W4.4. List the five most negative aspects of WIMS.

a. (1) Pulling personnel out of shops to man WIMS
(2) Weather affects operations

b. N/A

c. N/A

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. (1) The job permits me to decide on my own how and when the work is done.
(2) Lower level managers are allowed to make decisions that should be made by their supervisors.
(3) The organization encourages creativity and minimal complaince with rules.
(4) The job is unbearable.
(5) The job is simple and repetitive.

b. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Excellent - They do an outstanding job and are always willing to help with any problem that might arise.

b. N/A

c. Satisfactory

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Not known

b. N/A

c. Yes. Gives a bigger picture to shop foreman of total job output by shop as well as per individual worker.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes

b. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Of jst knowing how you are doing your job. Under the old manual system, job orders and work orders were always getting lost. Now it is impossible. It is the best foreman tool ever.

b. N/A

c. Has increased our total production output, improved customer ratio.

Protective Coating Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performace the most?

a. No response

b. No response

c. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No response

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. No response

c. No - Information will be provided, but no changes will be made. This statement is from past experience.

W4.3. List the five most significant contributions of WIMS.

a. No response

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. No response

c. N/A

W4.4. List the five most negative aspects of WIMS.

a. No response

N4.4. List what you perceive will be the five mt negative

aspects of WIMS.

a. No response

b. No response

c. No response

W4.5. Please rate the implementation of WIMS into you unit by circling one of the following (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. No response

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

c. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

Plumbing Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

b. I have not worked with WIMS.

c. N/A

N4.1. What factors do you perceive will be impacted the

most by WIMS and which ones will impact performance the most?

a. The foremen can control there own work and know exactly what the have in the system for long range planning and they can ensure that the right information is put into the system.

b. Job gives opportunities for independence & freedom organization encourages creativity & minimal compliance with rules. Job provides opportunities to completes work started.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. N/A

c. No - N/A

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes

b. Yes, I think so because the information I gave can provide necessary materials for them to see what goes on in the shop & areas around shop.

W4.3. List the five most significant contributions of WIMS.

a. No response

b. N/A

c. N/A

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) Shop level control
(2) Long range planning
(3) Proper input of information
(4) Control of job requirements
(5) Job coordination

b. (1) Supervisors & co-workers provide feedback.
(2) Job provides clues on my performance level.

(3) The stree factors of job.
(4) Tasks requires much experience & training.
(5) The job significant and importance to the scheme of things.

W4.4. List the five most negative aspects of WIMS.

a. No response

b. N/A

c. N/A

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. N/A

b. (1) Job are simple and require little or no experience.
(2) Job is unbearable.
(3) Job requires me to large number of complex or higher level skills.
(4) Job is when one person can be affected.
(5) By how well completion is done.

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Satisfactory

b. N/A

c. N/A

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. N/A

c. N/A

N4.6. Do you feel WIMS will increase the ability of an individal or section to influence the behavior of other individuals or sections? This influence could be in terms

of increased value of input into decisions or dictating how the organization conducts business.

a. Yes. You will be able to check workload of other sections in order to coordinate major work orders or job orders.

b. By supervisors and co-workers & talking giving feedback on job performance. Getting training & experience on high skilled tasks.

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

b. N/A

c. N/A

Masonry Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. With the WIMS program your able to recall job order and see who work the job, and when the job was completed. The one with the most impact is the time accountability and who working the jobs.

b. Total accountability for every last little item, time, etc. The system used at this base is down quite often makeing it hard to keep an up to date record that doesn't have any holes in it.

c. 2.1, 2.3, 2.5, 2.7, 2.11, 3.3, 3.5, 3.11, 3.12, 3.18

N4.1. What factors do you perceive will be impacted the mt by WIMS and which ones will impact perforance the most?

a. No response

b. If this information is used as a tool to help management better equipment foreman with the information to perform their jobs it can have a very positive impact of the work force.

c. Higher level managers make a greater number of decisions that should be made by lower level managers. The job is simple and repetitive. There is little pressure to perform my job. The job

provides me many chances to completely finish the pieces of work I begin. Supervisors often let me know how well they think I am performing on the job.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. Yes

c. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. Yes

c. Yes

W4.3. List the five most significant contributions of WIMS.

a. (1) Time accountability
(2) Person doing job
(3) Recall J/O
(4) Persons requesting job
(5) Job conpletion

b. No response

c. (1) Accurate schedualling
(2) Consistant time (EPS)
(3) A tracking device
(4) Phase calculation accurate
(5) Keeps MH expended

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. (1) Direct communication with management
(2) Better usage of supervisor skills
(3) Better production from shops
(4) Savings of money

c. (1) The job requires me to do a large variety of tasks involving a larger number of different skills

and talents.
(2) Dealing with other people is an absolutely essential and crucial part of doing the job.
(3) Higher level mangers make a greater number of decisions that should be made by lower level managers
(4) The job gives me considerable opportunities for indenpendence and freedom in how I do the work.
(5) Supervisor often let me know how well I am performing on the job.

W4.4. List the five most negative aspects of WIMS.

a. (1) Controller feeding the information on time
(2) Not able to make changes after a certain time
(3) Computer shut down during storms
(4) Feeding the wrong information
(5) The WIMS is as good as the people working the system.

b. No response

c. (1) Not pre-programmed for all remodelling
(2) Should include material control

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. No response

c. (1) The job requires me to use a large number of compx or higher level skills
(2) The job is unbearable
(3) The organization encourages creativity and minimal complaiance with rules
(4) The job is simple and repetitive
(5) Lower level managers are allowed to make decisions that should be made by their supervisors

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Satisfactory - Because the system is fairly new to the people using the WIMS and they consintly training new people hardly train on the system making mistake daily.

b. No response

c. Excellent - It's a good tool. But can be improved.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. The WIMS system is a good accountable system for time and man hours but it should be desine for the supervisor should be the people to put the information in the system instead if another getting it second hand to feed the information. I think the system influence and increased productivity in the section.

b. No response

c. Makes workers aware their work is being tracked by computer & their time spent is a matter of permi-nent record.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No

c. Yes

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Very little success on my part because I have had no training at all on the WIMS system but it does my accounting for people hours and job easy to account for.

b. No response

c. The info such as EPS and materials are consistent irregardless of who plugs in the requirements.

Metal Working Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Planned work orders are too hard to figure out and understand for AU. JOs that material is ordered on are unneccessary delayed, after material comes in, the paper ;work & computer status - location is not timely switched back to controller.

b. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. If close attention is paid to the responses recived & answers are honest ones WIMS can be benificial if measures are taken to correct trouble areas.

b. Top management will be able to get immediate feedback. It will also be a valuable tool for self-evaluation.

c. I have insufficient information about WIMS to answer these questions adequately.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No - I have answered several surveys and have not received any feedback from any of them. If I do from this one it may help.

b. Yes

c. No response

W4.3. List the five most significant contributions of WIMS.

a. (1) Daily status print outs

(2) You can request how many hrs. has been charged
(3) You can tell the data material came in
(4) You can close out cancel or transf from controller
(5) You can tell automatically when they get delinquent

b. (1) Instant recall of job orders
(2) Completed JO are shown
(3) Complete JO is shown
(4) Completed list of job orders & no to be worked

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) Have supervisors inform us on how we are doing
(2) Get an idea on where more training is needed
(3) Info on morale
(4) Overall pictures on all above Air Force wide
(5) Let supervisors know lower management would like a little more say in decisions

b. (1) Immediate feedback to the workers
(2) Immediate feedback to supervisors
(3) Goal centered
(4) People centered
(5) Aids in establishing guidelines

c. No response

W4.4. List the five most negative aspects of WIMS.

a. (1) Planned WOs not clear
(2) Controller can't input labor if another shop has JO
(3) Daily listings to much waste, should be available upon request
(4) Status/paperwork not timely transferred back to controller after mat comes in
(5) Many times controlled closes JOs they still on listings

b. No response

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. (1) If utilized properly none

b. (1) People may be reluctant to complete the information because they may feel that their responses can be traced

c. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Satisfactory - Because multi-shop JOs won't allow all controllers to input labor for their particular shop simultaneously, it has to be switched to each shop first. This is not feasible expecially if it is over several days.

b. No response

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No

b. No response

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes if we get some feedback on results for this survey.

b. Yes

c. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. It did not improve our operational performance enough to justify the cost of the system.

b. No response

Refrigeration Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. The work the controlers do. Being able to get a fast record of all J/O.

b. Control of Job orders.

c. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. Not familiar with WIMS.

b. Unknown

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. Yes

c. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Don't know

b. Unknown

W4.3. List the five most significant contributions of WIMS.

a. (1) Being able to watch J/O
(2) I can keep track of what the controler is doing
(3) Getting copies of J/O
(4) Checking out W/O

b. (1) Managing shop JO
(2) Information availability
(3) Control of work force

c. (1) Back logs
(2) Jobs in material control
(3) Jobs in progress

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. *Do not know*

b. Unknown

W4.4. List the five most negative aspects of WIMS.

a. (1) When the computer goes down

b. (1) CEMAS
(2) It creates a lot of paper to be handled

c. (1) No room for RPIE
(2) Unable to change commitment dates

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. Do not know

b. Unknown

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Satisfactory - There were a lot of bugs in the system.

b. Satisfactory - We were the developer of system.

c. Satisfactory

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. Yes

c. No response

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how

the organization conducts business?

a. Do not know

b. Unknown

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. It has helped me keep on top of J/O W/O shop hours.

b. I have a quicker, better overall view of whats happening in my section. It helps to make decisions having information instantly available.

c. No response

Liquid Fuels Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Tracking job and work order, accountability

b. N/A

c. I am not authorized to use computers at Tinker AFB. N/A

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. I have no knowledge of the WIMS program.

b. Immediate feedback to supervisors & commanders.

c. Management has not brifed us on the WINS system in ATC.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. No response

c. N/A

N4.2. Do you think WIMS will provide the information needed

for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. Yes

c. Unkown

W4.3. List the five most significant contributions of WIMS.

a. (1) Instant access to information
(2) Saves time
(3) More accurate than manual method
(4) Have record of jobs performed
(5) provides daily status of shop schedule

b. No response

c. N/A

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. (1) Feedback to commanders & supervisors
(2) Traser for attitudes toward work & mission

c. Unknown

W4.4. List the five most negative aspects of WIMS.

a. (1) Seems to be affected by thunderstorms

b. No response

c. N/A

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. (1) People may feel reluctant to fill out the questionaire for fear of their responses being traced

c. Unknown

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation

this rating.

a. Excellent - I believe implementation of the WIMS has gretly improved the overall productivity rate of the 2854th CES.

b. No response.

c. N/A

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes: by tracking each secther or unit we can observe what one section is doing or not doing, therefore giving the organization a great tool to work together and perform the missions in a more effective manner.

b. No response

c. N/A

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. Yes

c. Unknown. Once management briefs shop foremen and supervisors on WINS then we may make a decision on system.

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. I believe the WIMS has given me the opportunity to observe shop performance in terms of meeting the schedule and helps me track all ongoing work.

b. No response

c. N/A

Heat Systems Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. WIMS has not been fully implemented at this base. This answer would apply to all following questions.

b. Labor time inputs take longer to put into the computer (that requires 2 to 3 minutes per person). The controller is more of a time-keeper now. They still have to make notes when job-changes occur. Too many terminals on one CPU.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. No response

b. Better management of JOs.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No - See above

b. Yes - Accuracy of the time accounting is significant.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes

b. Yes

W4.3. List the five most significant contributions of WIMS.

a. No response

b. (1) Good history record of job orders
(2) Simple to operate
(3) Less paperwork
(4) Accuracy of manhour accounting

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) Speed in getting information
(2) Keeping sections up to date on equip/equip

status
(3) Helping in future work projections

b. (1) Getting rid of zoned job orders
(2) Better management of job orders
(3) More control of work

W4.4. List the five most negative aspects of WIMS.

a. No response

b. (1) Controller is a time keeper no time to control
(2) Shop is controller supervisor assigns all work
(3) Duplication of effort (supervisor controller does same tasks)
(4) Shops have a person (NCOIC) usually to screen all incoming jobs.

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. (1) I see none

b. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. No response

b. Excellent - It took about 8 months to completely implement, and generally most systems take a couple years.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No - WIMS in my opinion has little effect on decisions in conducting business. This is still the man behind the wheel.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other

individuals or sections? This influence could be in terms of increased value of input into decisons or dictating how the organization conducts business.

a. It could be as in their need to get information about our equipment and its status.

b. No

W4.7. Please describe the suceess of WIMS in terms of the impact it has had on your performance.

a. No response

b. WIMS only covers DEM Admin. We still have too systems WIMS and BEAMS. We need one system to really have an impact on performance.

Interior Electrical Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

b. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. I cannot comment on this system since we have not had any type of briefing or training on WIMS.

b. I do not know enough about this program to make comments on it.

c. No response

d. No response

e. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No response

b. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. Yes

c. No response

d. No - You have to work w/each section on a separate basis. You can/t categorize too many chiefs.

e. No response

W4.3. List the five most significant contributions of WIMS.

a. No response

b. No response

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. No response

c. No response

d. No response

e. No response

W4.4. List the five most negative aspects of WIMS.

a. No response

b. No response

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. No response

c. No response

d. No response

e. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. No response

b. No response

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

c. No response

d. No

e. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

b. No response

Exterior Electrical Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. N/A

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. I have no information on the WIMS system at this time. I talked to our production control people but they wont not offer any information.

b. No response

c. No response

d. N/A

e. Tracking material status

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How could it be changed?

a. N/A

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. No response

c. No - WIMS not but a survey of supervisors through out their work environments. Each section differs from one place to another.

d. N/A

e. Yes

W4.3. List the five most significant contributions of WIMS.

a. N/A

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. No response

c. (1) Judgement
(2) Job enviroment
(3) Attitudes
(4) View of management
(5) Perceptions

d. N/A

e. (1) Material status
(2) Equipment status
(3) Material research
(4) Scheduling coordination
(5) Meeting suspense dates

W4.4. List the five most negative aspects of WIMS.

a. N/A

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. No response

c. (1) Individual jobs

d. N/A

e. (1) Terminal time
No other negative thoughts.

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. N/A

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. N/A

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. No response

c. Possible - The Air Force needs to look at the overall picture of future requirements. So many times have things been blown out of porportion through management, section, shops, and etc. before things are accomplish. Schools and stiffer training requirements are needed to wash-out the hog being use today.

d. N/A

e. Yes, should be very helpful with job coordination

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. N/A

Generator Maintenance (Power Production) Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

b. Scheduling of work impacted the most. Indirect labor for training on the job and Prime Beef exercises.

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. Stress, foreman control

b. No response

c. No response

d. Statements 2.1, 2.7, 2.11, 3.5, & 3.15. 2.7 will impact the most

e. No response

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No response

b. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No - I doubt we will ever see the results.

b. I haven't been brief or attended a class on the WIMS. So I have no ideal what it offers or in disadvantage of the system.

c. No response

d. Yes

e. No - Not enough question on the job that we do. On the stand-by gen.

W4.3. List the five most significant contributions of WIMS.

a. No response

b. (1) Recurring maint. accountability
(2) Scheduling of work orders
(3) Labor analysis
(4) Tracking emergency job orders
(5) Aid in planning work

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) Stress
(2) Leadership
(3) Repetition
(4) Different skills to profession
(5) Job comfort

b. No response

c. No response

d. (1) Allow individual to express his/her opinion
(2) Serve as a management tool
(3) Serve as a adjustment mechanism
(4) Provides information to where you stand
(5) Gives you an idea where your weaknesses are

e. No response

W4.4. List the five most negative aspects of WIMS.

a. No response

b. (1) All direct work is not identified (weekend trng or reserves, etc.)
(2) Codes should be expanded to project more realistic picture
(3) Training hours should reflect direct labor not indirect
(4) Supervision is directly involved in all work
(5) Leave should be identified separate from indirect work

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. (1) Nothing negative

b. No response

c. No response

d. (1) None

e. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. No response

b. Marginal - Short time since implementation has not allowed full understanding of entire system.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. Yes mainly in scheduling of work.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Yes

b. No response

c. No response

d. Yes, I feel it will increase the ability of an individual or section to influence the behavior of others. It will serve as a guideline to follow to increase productivity.

e. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

b. Still in "learning" phase of system uses as a management tool. All aspects have not been fully explained as to how to use WIMS to it's advantage

for increased performance of all involved.

Water and Waste Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. Eliminated need to store as much paperwork. Materials - locations/quanity easily traced and transferred when required.

b. No response

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. This base is not on WIMS system.

b. Not enough info. of WIMS to evaluate.

c. I have no knowledge of this program, no briefing was done to my knowledge.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. Yes

b. No - Imput about certain items that pertain to water & waste should be put into WIMS. ie water well production, waste water amounts treated and claimed analysis.

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. No response

b. Same as 4.1.

c. No response

W4.3. List the five most significant contributions of WIMS.

a. (1) All information is ledgable
(2) Info can be obtained quickly
(3) Copies basically on the spot
(4) Changes show up immeddiatly

b. (1) Not that fimular

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. No response

b. Same as 4.1.

c. No response

W4.4. List the five most negative aspects of WIMS.

a. (1) Terminals sometime respond slow
(2) Down time
(3) Some job orders hard to write when EPS don't match
(4) Product can be lost/erased

b. (1) Not fimular

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. No response

b. Same as 4.1.

c. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. Excellent - You have to anticipate some problems changing over and ours seem few and very brief in nature. I was surprised at how quickly the WIMS system seemed to make you forget you had done it any other way.

b. Not fimular

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. Can't say at this time no sure if any change has occurred.

b. Not fimular

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. Same as 4.1.

c. No response

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. Makes my job easier in indentifying upcoming work, project locations (difficlut branches/, overdue job orders, transferring material usage (WIMS-BEAMS)

b. Not fimular

Entomology Foreman

W4.1. What factors were impacted the most by WIMS and which ones impacted performance the most?

a. No response

b. Job daily work schedule, composite on pest management transcript

N4.1. What factors do you perceive will be impacted the most by WIMS and which ones will impact performance the most?

a. RMP, reoccuring maint, pest control report. JPAs, APR can be included the most

b. Have never heard of this system therefore am not familiar with it. If this is similar to the RWP system it will be another burdon on the back of the supervisor and encourage creative deception to get the figures management wants to see and not necessarily the truth.

W4.2. Does WIMS provide the information needed for you to manage your branch/section? If not? How should it be changed?

a. No response

b. Yes

N4.2. Do you think WIMS will provide the information needed for you to manage your branch/section? If not? What information will not be provided?

a. Yes - to a certain extent. This job is covered by many regulations (EPA, OSHA, DOD, we msut be ATC certified) with all of these plus WIMS it might be confusing and under payed.

b. No - Check above

W4.3. List the five most significant contributions of WIMS.

a. No response

b. (1) Daily man-hour schedule
(2) Composite on pest management

N4.3. List what you perceive will be the five most significant contributions of WIMS.

a. (1) This working center has not received information of WIMS.

b. No response

W4.4. List the five most negative aspects of WIMS.

a. No response

b. No response

N4.4. List what you perceive will be the five most negative aspects of WIMS.

a. (1) RMP
(2) JPAs
(3) APR
(4) Pest control reports

b. No response

W4.5. Please rate the implementation of WIMS into your unit by circling one of the following. (Unsatisfactory - Outstanding) Please explain why you gave the implementation this rating.

a. No response

b. Satisfactory - For me it work verfy good, but for the rest of the unit I'm not that familiar.

W4.6. Has the introduction of WIMS increased the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No response

b. To me work is the same as before.

N4.6. Do you feel WIMS will increase the ability of an individual or section to influence the behavior of other individuals or sections? This influence could be in terms of increased value of input into decisions or dictating how the organization conducts business.

a. No unless harder and closer look thru out the Air Force is looked at the pest controller job description. Higher requirements are made thru school certification etc., chemical knowledge,

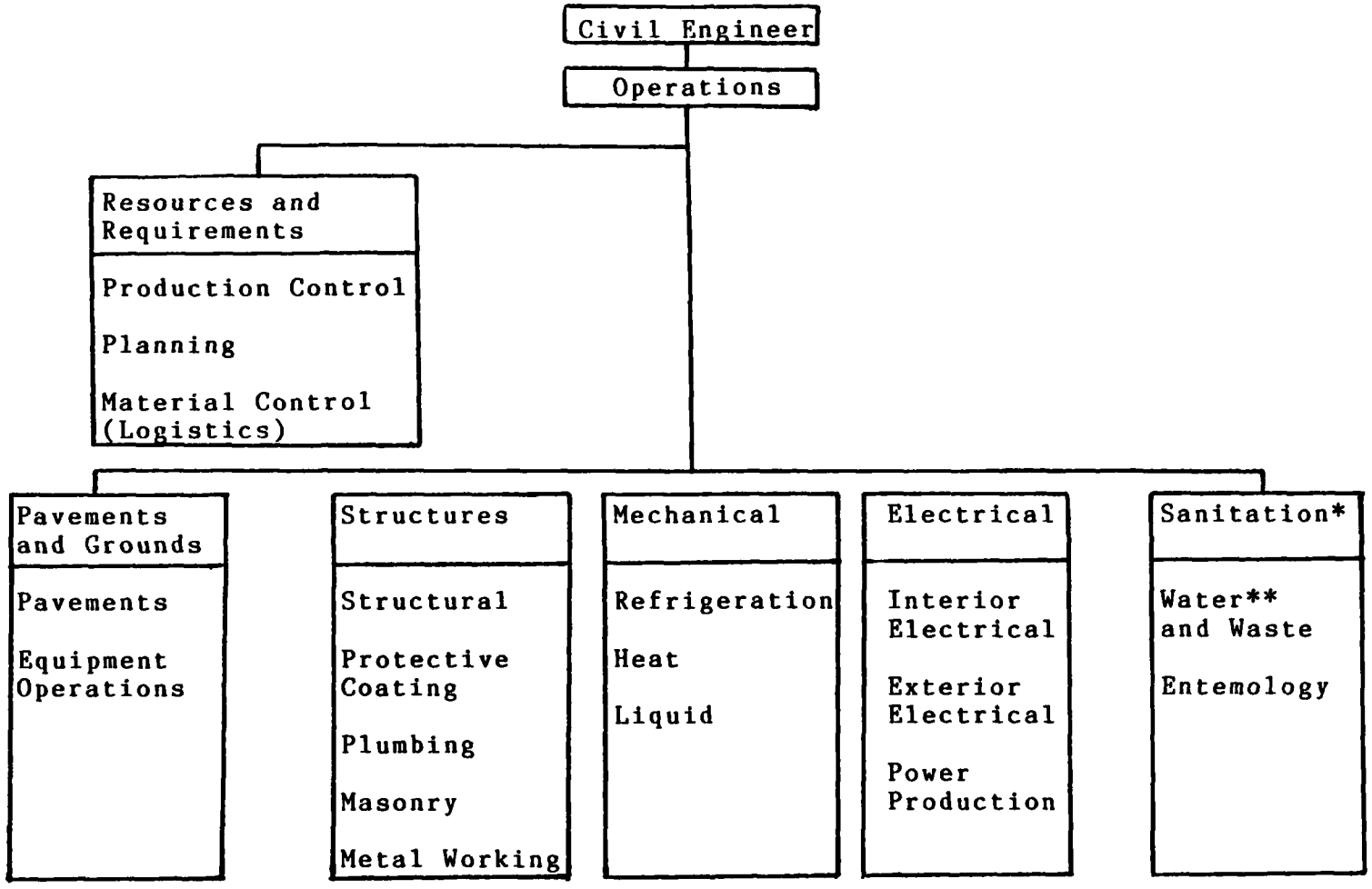
safety, while other less job knowledge are higher grades.

b. Tools such as this are virtually worthless for the 566X0 (Entomology) career field. EPA regulations and local laws coupled with USAF Reg 91-21, Pest Management Program) is all a shop needs to function with. Possibly an in shop computer would help in records keeping and records. Again the WINS system will probably be a nightmare for shop foremen to please only those whom are inclined to technocracy.

W4.7. Please describe the success of WIMS in terms of the impact it has had on your performance.

a. No response

b. As stated before the work is much the same as before WIMS.



* This level consists of superintendents
** This level and below consists of foremen

Fig. 3 Typical Base CES Partial Structure
(adapted from AFR 85-10,1975, p.19)

Bibliography

1. Bickson, T. K. and B. A. Gutek. "Advanced Office Systems: An Empirical Look at Use and Satisfaction," National Computer Conferences, 313-328 (1983).

2. Cerullo, Michael J. "Productive Use of Computers," Managerial Planning, 33 No 6: 61-65 (May/June 1985).

3. Croft, W. Bruce and Lawrence S. Lefkowitz. "Task Support In an Office System," ACM Transactions on Office Information Systems, 2 No 3: 197-212 (July 1984).

4. Department of the Air Force. Operation and Maintenance of Real Property. AFR 85-10. Washington: HQ USAF, 24 October 1975.

5. Devore, Jay L. Probability and Statistics for Engineering and the Sciences. Monterey: Brooks/Cole Publishing Company, 1982.

6. Emory, William C. Business Research Methods. Homewood IL: Richard D. Irwin, Inc., 1980.

7. Gould, John D. and Clayton Lewis. "Designing for Usability: Key Principles and What Designers Think," Communication of the ACM, 28 No 3: 300-311 (March 1985).

8. Hackman, J. R. and G. R. Oldham. "Motivation Through the Design of Work: Test of a Theory," Organizational Behavior and Human Performance, 16: 250-269 (1976).

9. Hamill, Maj, USAF. "Work Information Management System (WIMS)," Air Force Engineering and Services Quarterly, 12 (Summer 1984).

10. Ives, Blake and Norman L. Chervany. "Alternative Date Entry Technologies and Settings: Impact on Worker Attitudes and Behavior," Information and Management, 6 No 1: 37-47 (1983).

11. King, William R. "Integrating Computerized Planning Systems Into the Organization," Managerial Planning, 32 No 1: 10-13 (July/August 1983).

12. Kling, Rob. "Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research," Computing Surveys, 12 No 1: 61-110 (March 1980).

13. Kling, Rob and Suzanne Iacono. "The Control of Information Systems Developments After Implementation," Communications of the ACM, 27 No 12: 1218-1226 (December 1984).

14. Lee, H. C. "Do Workers Really Want Flexibility on the Job?" Personnel, 74-77 (March/April 1965).

15. Lucas, Jr., Henry C. "Measuring Employee Reactions to Computer Operations," Sloan Management Review, 15 No 3: 59-67 (Spring 1974).

16. Lucas, Jr., Henry C. "Unsuccessful Implementation: The Case of a Computer-Based Order Entry System," Decision Sciences, 9 No 1: 68-79 (1978).

17. Moan, Floyd E. "Does Management Practice Lag Behind Theory in the Computer Environment?" Academy of Management Journal, 16 No 1: 7-23 (March 1973).

18. Mowday, Richard T. "The Influence of Task and Personality Characteristics on Employee Turnovers and Absenteeism Incidents," Academy of Management Journal, 24 No 3: 634-642 (September 1981).

19. Moschner, Kenneth W. and Frederick W. Nightengale. A Study of the Relationship Between User Attitudes and the Success of the MAJCOM and AFRCE Work Information Management System. MS Thesis, GEM/LSM/84S-15. School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB OH, September 1984 (AD-A146 956).

20. Nie, Norman H. and C. Hadlai Hull. SPSS Update 7-9: New Procedures and Facilities for Releases 7-9. New York: McGraw-Hill Book Company, 1981.

21. Nie, Norman H., C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner, and Dale H. Bent. SPSS Statistical Package for the Social Sciences (Second Edition). New York: McGraw-Hill Book Company, 1975.

22. Paddock, Charles E. and Richard W. Scamell. "Office Automation Projects and Their Impact on Organization, Planning, and Control," ACM Transactions on Office Information Systems, 2 No 4: 289-302 (October 1984).

23. Pfeffer, Jeffrey and Huseyin Leblebici. "Information Technology and Organizational Structure," Pacific Sociological Review, 20 No 2: 241-261 (April 1977).

24. Redmiles, SMSgt, USAF. "Base Civil Engineering Operations Branch Reorganization," Air Force Engineering and Services Quarterly, 10 (Summer 1984).

25. Robey, Daniel. "Computer Information Systems and Organization Structure," Communications of the ACM, 24 No 10: 679-687 (October 1981).

26. -----. "Computers and Management Structure: Some Empirical Findings Re-examined," Human Relations, 30 No 11: 963-976 (1977).

27. -----. "MIS Effects on Managers' Task Scope and Satisfaction," National Computer Conference, 391-395 (1979).

28. -----. "User Attitudes and Management Information System Use," Academy of Management Journal, 22 No 3: 527-538 (1979).

29. Robey, Daniel and M. M. Bakr. "Task Redesign: Individual Moderating and Novelty Effects," Human Relations, 31 No 8: 689-701 (1978).

30. Robey, Daniel and M. Lynne Markus. "Rituals in Information System Design," MIS Quarterly, 8 No 1: 5-15 (1984).

31. Robey, Daniel and Richard L. Zeller. "Factors Affecting the Success and Failure of an Information System for Product Quality," Interfaces, 8 No 2: 70-75 (February 1978).

32. Rockert, John F. and Adam D. Crescenzi. "Engaging Top Management in Information Technology," Sloan Management Reveiw, 25 No 4: 3-16 (Summer 1984).

33. Schewe, Charles D. "The Management Information System User: An Exploratory Behavioral Analysis," Academy of Management Journal, 19: 577-590 (December 1976).

34. Spillers, David and Chuck Ayars. "The Air Force Engineering and Services," The Military Engineer, 76 No 497: 494-495 (1984).

35. Tucker, Alan E. M. Information Technology Impacts on Organizations. Unpublished Technical Paper, Ohio State University, Columbus OH, April 1984.

36. Turner, Jon A. "Computer Mediated Work: The Interplay Between Technology and Structured Jobs," Communications of the ACM, 27 No 12: 1210-1217 (December 1984).

37. U.S. Department of the Air Force. Engineering and Service Strategic Plan. Washington: HQ USAF, March 1983.

38. Whisler, Thomas L. and Harold J. Leavitt. "Management in the 1980's," Harvard Business Review, 41-48 (November-December 1958).

39. Wildavsky, Aaron. "Information as an Organizational Problem," Journal of Management Studies, 20 No 1: 29-40 (1983).

40. Woolf, Henry Bosley. Webster's New Collegiate Dictionary. Springfield: G&C Merriam Company, 1975.

41. Work Information Management System (WIMS) Information Resource Requirement Document. Par: HAF-F81-1 and HAF-F81-101, 2 September 1983.

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In this research, the impact of the newly implemented Work Information Management System (WIMS) on civil engineering operations managers' was examined. The main purpose was to determine if WIMS impacted managers' perceptions of various job factors including task variety, task identity, task significance, autonomy, feedback, job pressure, difficulty/skill level, job satisfaction, amount of dealing with others, centralization, formalization, and organizational politics.

Managers, ranging from the Chief of Operations to shop foremen, were surveyed. Data were collected from five organizations that had implemented WIMS, the test group, and from five organizations that had not implemented WIMS, the control group. The test group's responses were compared against the control group's responses to determine the impact of WIMS. The results indicated that the test group perceived dealing with others a more essential part of their jobs than the control group. When subdivided into levels of managers, the results indicated test group senior managers perceived their jobs to be more significant and test group operational managers perceived their jobs to require a higher skill level than the control group's corresponding level of managers. Responses to open-ended questions indicated the overall perception of WIMS is positive. WIMS is greatly aiding the handling of work documents, and in turn, helping managers improve their effectiveness.

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