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Running Head: OCCUPATIONALLY-SPECIFIC SKILLS

Occupationally-Specific Skills:

Using Skills to Define and Understand Jobs and their Requirements

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Abstract

Recent work in Human Resources (HR) has highlighted the importance of understanding and identifying occupationally-specific skills. The purpose of this article is to describe the need to identify occupationally-specific skills and outline a methodology used to create occupationally-specific skills. Evidence of the validity of the methodology used is presented. The article concludes by identifying possible uses for occupationally-specific skills and providing information about actual implementation and use of systems based on occupationally-specific skills.

Occupationally-Specific Skills:

Using Skills to Define and Understand Jobs and their Requirements

In recent years concern has been expressed by public officials, education experts, policy makers, and a host of others regarding the state of skills in the current work force in the United States as well as other industrialized nations (Handel, 2003; Taylor, 2005). In a survey of manufacturing firms, skill shortage was reported across various sectors, affecting 80% of those who were surveyed. Further, respondents reported that these shortages are limiting their ability to produce, serve customers, and affect business growth (Eisen, Jasinowski, & Kleinert, 2005). The combined effects of globalization, technological changes, and the changing nature of work and organizations have created the need for increased level of skills (Cascio, 1995; Handel, 2003; Sanchez, 2000). Further, studies have shown that the availability of employees that are able to continuously update, upgrade, and adapt their skills to the demands of the changing organization are important for organizational productivity and growth (Bhattacharya, Gibson, & Doty, 2005; Morgeson, Delany-Klinger, & Hemingway, 2005).

One important issue that should be addressed at this point is the definition and scope of skills. Many of the empirical and theoretical works that address the issue of the skills gap or the need for skilled workers include within their definition of skills multiple constructs including problem solving and critical thinking skills, technical skills, interpersonal skills, adaptability, motivational variables, as well competencies, thus leading to further confusion (Handel, 2003). For the purpose of this paper, the definition used for Occupational Information Network (O*NET) skills has been adopted. Mumford, Peterson, and Childs (1999) define skills as "procedures for acquiring and working with information" (Mumford, Peterson, & Childs, 1999,

p.50). One important consequence of this definition is that skills are trainable or changeable and are not necessarily stable. This has important implications for the use of skills in various human resources (HR) applications.

This definition highlights an important point that makes the focus on skills more important in today's business environment. Work and organizations are changing due to rapid technological change, globalization, and structural changes in organizations (such as work teams or increased autonomy). This rapid change in work requirements means that traditional job analysis information and HR applications that focus on static tasks and work behaviors are no longer appropriate (Sanchez, 1994). In contrast, skills provide a more dynamic and flexible approach to job analysis. As a result of changing jobs and organizations, the need for a skilled workforce is increasing. The availability of such a skilled workforce is called into question by many in the field. Addressing this skilled labor shortage may take many forms, such as through curriculum changes in education. The role of organizations in addressing this labor shortage has been emphasized. HR reform efforts have focused on increasing the skills in the workforce through more effective personnel selection, training, pay structures, career planning, and workforce planning that will allow HR to become a strategic partner (Sanchez, 1994). The need for HR reform is particularly apparent in the Federal Government where the skills gap takes on a special significance. Several surveys of the Federal Government workforce have identified that 50%-70% of the employees, especially those in skilled, professional, and managerial jobs will be retiring in the next 5-10 years, and the number of younger employees filling the ranks is limited (Liebowitz, 2004). To address this skills gap the position of Chief Human Capital Officer has been created in the Federal Government.

The importance of the skills gap for current and future HR applications has indicated that identifying skill requirements is critical. By identifying occupational skill requirements, organizations will be able to use various HR applications to identify skill gaps, identify the most critical skill shortages, and take steps to remedy those shortages. Further, focusing on skills as the core for HR reform and applications provides organizations with several advantages. One important advantage is that while specific behaviors, or tasks may change rapidly as a result of job, organizational, structural, or technological changes, skill requirements seem to be more stable and more easily transferable to different jobs or as jobs change (Mumford et al., 1999). Similarly, skills seem to be more critical in creating career development plans utilized for both employee self-development and career progression within the organization (London & Smither, 1999).

This focus on skills was not always routinely done in past job analyses. Much of the work on the worker requirements for jobs has stemmed from job analysis work focusing on understanding broad and general worker characteristics required for successful job performance (Brannick & Levine, 2002). Previous efforts using worker-oriented approaches have focused on the use of data collected from established surveys such as the Position Analysis Questionnaire (PAQ) (Brannick & Levine, 2002; Harvey, 1991). In addition to the use of established taxonomies, knowledge, skills, abilities, and other characteristics (KSAOs) information can be collected from SMEs, in a similar fashion to task statements, by using SME meetings to generate a list of KSAOs. KSAO information collected from SMEs tends to be extremely specific and narrow (e.g., skill at operating a crane, ability to change a car tire). This specificity results in KSAOs that seem at times more like tasks or behaviors, are not based on psychological theory, and cannot be compared across different jobs (Brannick & Levine, 2002; Williams & Crafts, 1997).

Previous efforts therefore have resulted in a focus on broad abilities (such as those suggested by Fleishman and Mumford, 1991) or very job specific, almost behavioral lists of KSAOs (Mumford et al., 1999; Williams & Crafts, 1997), which both have limitations.

As the previous discussion suggests, while skills are critical for current HR applications and for HR reform, skills have not been the focus of most job analytic efforts in the past. The scientific study of skills has been lagging relative to other types of worker characteristics such as abilities. Going forward, the need for understanding skills and a taxonomy of skills is imperative for developing HR applications that would address the skills gap. O*NET has provided a skills taxonomy that offers a first step in the development of occupationally-specific skills.

O*NET

O*NET was developed by the Department of Labor to replace the Dictionary of Occupational Titles (DOT), with a new, comprehensive job analysis system aimed at providing a common language for describing jobs across organizations (Dye & Silver, 1999; Peterson, et al., 2001). O*NET was developed to address three needs. First, O*NET addresses the need for multiple descriptor domains. This would allow for jobs to be described in multiple ways (e.g., work and worker based). Second, O*NET addresses the need for a common language that would apply across a variety of jobs and organizations. Third, O*NET addresses the need for a hierarchical approach that would allow for both narrow and specific descriptors embedded within broad and general descriptors (Peterson et al., 2001).

The O*NET content model includes six domains: worker characteristics, worker requirements, experience requirements, occupational requirements, occupation characteristics and occupation-specific requirements. Each domain is further delineated and includes taxonomies for the description of work and the worker (Mumford & Peterson, 1999). The

taxonomies included in the O*NET content model (such as General Work Activities or GWAs, skills, and abilities) are designed to be broad, general, and apply to multiple jobs. The O*NET skills taxonomy, of specific interest for the purpose of this article, provides the first comprehensive taxonomy of occupational skills (Mumford, et al., 1999).

The O*NET definition of skills, suggested by Mumford at al. (1999) as "procedures for acquiring and working with information" (Mumford, Peterson, & Childs, 1999, p.50) suggests three important implications. First, as previously stated, skills are not necessarily enduring characteristics of the individual, but rather depend on experience and practice, and therefore may be more adaptable. Second, skills can be defined at varying levels of generality, with the O*Net skills taxonomy providing a broad and general level. Third, skills must be defined in terms of the performance domain. This link to a performance domain provided the bridge between broad and general skills to the specification of occupational skills.

Mumford et al. (1999) have identified five general performance domains leading to five domains of workplace skills. These domains of workplace skills, which Mumford et al. (1999) refer to as cross-functional skills, apply across jobs, and include (a) problem solving skills, (b) technical skills, (c) social skills, (d) system skills, and (e) resource management skills. In addition, Peterson et al. (1999) also identified basic skills that provide the foundation for learning. Basic skills include two categories of skills, content skills and process skills. Table 1 includes the O*NET skill taxonomy, listing the 46 skills within these broader categories and their definitions.

Empirical work using the skills taxonomy has provided initial support for the validity of the skills in describing jobs (Mumford et al., 1999). However, Mumford at el. note that these basic and cross-functional skills are designed to be broad and general and apply to all jobs to

some extent. Therefore, occupationally-specific skills, which are more narrow and specific skills, were not generated as part of the Mumford et al.'s validation effort. The purpose of this article is to argue for the importance of occupationally-specific skills that are anchored in the O*NET skill taxonomy, provide a procedure for the generation of occupationally-specific skills, and discuss the utility of such information.

Occupationally-Specific Skills

Peterson et al. (2001) suggest that obtaining occupationally-specific information is necessary for understanding jobs. Some uses of job analysis information such as developing training programs, require a more in depth understanding of occupationally-specific tasks, skills, and abilities. Traditional job analysis methods focusing on the work performed already provide a procedure on how to obtain occupationally-specific information about tasks. However, only recently has the need for systematic development and understanding of occupationally-specific skills been discussed more in-depth (Mumford et al., 1999). The need for a focus on skills has been discussed earlier, however, it is important to stress that not only is there a need to focus on more general and broad categories of skills such as those offered by O*NET, but also to understand occupationally-specific skills. Occupationally-specific skills are narrower than the broad and general skills suggested by Mumford et al. (1999). Occupationally-specific skills involve the application of the broader skill in a specific performance domain (Mumford et al., 1999). These occupationally-specific skills are limited to one occupation or a set of occupation (such as a job family), but are not designed to cut across all jobs. However, these more specific skills can be utilized across jobs when jobs include similar occupationally-specific skills.

Traditional applications of job analysis in which occupationally-specific information is obtained treat each job as unique. Therefore, this information cannot be compared to other jobs

because a unifying broader framework is not available (Mumford & Peterson, 1999). In addition, there is no link between job activity taxonomies (such as GWAs) and KSAO taxonomies (Schmitt & Robertson, 1990). To allow for comparisons between jobs, and therefore flexibility and efficiency in training design, the occupationally-specific information needs to be anchored in a broader, more general and theoretical context. O*NET was specifically designed to provide this broader context but not job specific information. While the O*NET content model does not provide directly occupationally specific information such as tasks or occupationally-specific skills, it is possible to use the O*NET content model to develop this sort of information. Using the O*NET framework for the development of occupationally-specific information ensures that the information obtained is tied to a broader and a more theoretical approach, providing additional benefits. Job specific information can be used where appropriate and cross-job comparisons can still be made by linking occupationally-specific information to general and common job descriptive information. Moreover, because the occupationally-specific skills are developed based on a theoretically meaningful taxonomy, they should be more theoretically meaningful as well. Finally, Sackett and his colleagues (Sackett, 1991; Sackett & Laczo, 2003) have suggested that job information that is too general may lead to the conclusion that jobs are similar, whereas information that is too specific may emphasize differences between jobs. The determination of the level of specificity should be based on the purpose and use of the information (Sackett & Laczo, 2003). Having both general and broad information and occupationally-specific information allows multiple uses and comparisons, as well as more accurate comparisons across jobs.

Developing Occupationally-Specific Skills

A procedure for the development of occupationally-specific skills has been outlined by Mumford et al. (1999) and Peterson et al. (2001), and will be further elaborated in this paper. This procedure involves linking the O*NET skills to tasks and then identifying tasks with the same skill requirement. Groupings of similar tasks and subsets of specific skills within the broader skill can be identified by focusing on tasks that require similar skills for effective performance. Because occupationally-specific skills are defined as the application of a broader more general skill in a specific performance domain, procedures for the development of occupationally-specific skills must include additional information that would provide the context or the performance domain to which the skill is applied.

The development of occupationally specific skills starts with grouping similar tasks together. SMEs review the tasks within a smaller grouping (typically work dimension, GWA or a similar grouping mechanism) and determine if any of the tasks within the group are related to one another. Because the focus is on occupationally-specific skills, SMEs are encouraged to think about those tasks that are performed together, trained together, and require similar skills. Once several tasks have been identified as relating to one another, SMEs provide a meaningful title. Providing the title is an additional way to ensure that these tasks are grouped in a meaningful way, as it is difficult to come up with a concise title if tasks are not related or only loosely related to one another. SMEs review all the tasks and group them in this fashion.

To further develop occupationally-specific skills, SMEs are asked to provide additional information. This additional information includes listing the specific tools and equipment used when performing these tasks, unique knowledges required for performance of these tasks, and resources needed to complete the group of tasks. Moreover, this additional information provides the context in which the task is performed and delineates further how the skills are applied in a

specific performance domain. In addition, tasks are also linked to the O*NET skills and abilities, which are then also included in the final occupational-specific skill. The result is a group of tasks that are similar, learned or performed together, use similar skills, abilities, tools, knowledges, and resources, and which together describe the specific occupational skill requirements. Figure 1 provides examples of occupationally-specific skills including all their elements.

While the O*NET skills provide a broad overview of the general skills necessary for job performance, a more specific skill can be identified by evaluating which specific tasks require the general skill as well as the associated tools, knowledges and resources. This procedure allows for the identification of how broad skills are applied within the context of the job. Further, in some cases, the same broad skill may be applied in multiple domains or contexts within the same job, thus requiring somewhat different occupationally-specific skills. For example, Equipment Maintenance is a broad and general skill, and one of the cross-functional skills of O*NET. However, the type of equipment that needs maintaining will change based on the job. Specific occupationally-specific skills for a computer technician within the broad skills of Equipment Maintenance may include “Computer Equipment Maintenance” or “Calibration of Electronic Equipment.” As these titles suggest, use of occupationally-specific skills provides additional context and detail about how the general skill is applied in a specific occupation. In addition, these occupationally-specific skills may also be applicable to other occupations such as communication network technician, allowing for some degree of transportability. As this example suggests occupationally-specific skills may apply to one occupation, but they may also apply to a family of occupations. Further, a review of the detailed occupationally-specific skills presented in Figure 1 highlights the inclusion of multiple aspects of occupationally-specific information, including tasks, tools, knowledges, and resources. This detailed occupationally-

specific information provides additional benefits in the use of occupationally-specific skills, which will be detailed later.

Reliability and Validity

Occupationally-specific skills are created using SME judgment about task similarity. Though SME judgment is necessary, additional support for these judgments is also gathered to ensure these are appropriate and meaningful representations of the job and to evaluate the reliability of these judgments.

Reliability

To evaluate the reliability of task groupings and identify additional information, two SMEs created occupationally-specific skills independently, and their results were compared to determine inter-rater reliability. Three jobs were selected for the purpose of this paper to compare SME groupings against each other. The three jobs selected include Skills Analyst, Senior Skills Analyst and Skills Compliance Officer. Inter-rater agreement was calculated for each component of the occupationally-specific skill: tasks, tools, unique knowledge, and resources, for each occupationally-specific skill developed within each job.

First, occupationally-specific skill titles were examined to identify similar groupings. By identifying similar titles, a common content area could be identified to estimate inter-rater agreement between the information being grouped in the similar occupationally-specific skills. Evaluating the overlap in occupationally-specific titles, 43% to 60% of the titles were identical or very similar for the three jobs evaluated. Next, the tasks, tools, knowledge and resource were also compared against the groupings from the SMEs. For example, in the Skills Analyst job both SMEs created an occupationally-specific skill titled “Data Analysis.” These were determined to be similar titles and the groupings of tasks, tools, knowledge and resources were compared

against each other to estimate inter-rater reliability. An example of an occupationally-specific skill comparison is presented in Table 2.

Percent agreement for each element of the occupationally-specific skill (tasks, tools, etc.) was calculated by first determining the number of task, or tools, and so forth that overlapped between the first SME and the second SME. This value was then divided by the total number of each element in the occupationally-specific skill generated by first SME, and again for the second SME. The results were added together, divided by 2, and multiplied by 100, to create percent agreement. Once the percent of agreement was calculated for all elements in an occupationally-specific skill, the totals were aggregated for an overall occupationally-specific skill agreement. In addition, a percent agreement for each of the components was also calculated (percent agreement on tasks, on tools, etc.). Finally, a total percent agreement was calculated for each job which was determined by summing all occupationally-specific skill agreement totals and dividing by the number of occupationally-specific skills created for the job. Table 3 provides summary information based on overall occupationally-specific skills and Table 4 provides information based on components of the occupationally-specific skills across the three positions.

A review of these tables reveals that the average agreement for three jobs ranges from 47.92 to 72.44, indicating some degree of agreement. There is quite a bit of variability in the degree of agreement for each occupationally-specific skill and across jobs. For the Skills Analyst job agreement ranges from 21.36 (showing very low agreement) to 78.16, with seven of the 10 occupationally-specific skills showing more than 50% agreement across all components. The average agreement was 75.49, and the median was 55.00. For the Senior Skills Analyst position, agreement ranges from 14.82 to 66.15, showing less agreement than the previous job. However, four out of six occupationally-specific skills showed agreement of 50% or better. The average

agreement was 47.92, with the median at 55.58. Finally, for the Skills Compliance Office agreement ranged from 48.75 to 87.08, showing a much higher degree of agreement, with eight out of nine occupationally-specific skills showing agreement of 50% or better, and six out nine showing agreement of 75% or better across all components. The average agreement was 72.44 and the median was 75.00.

Looking at each component provides information about which of the specific aspects of information included in the occupationally-specific skill tends to show higher levels of agreement. Higher degrees of agreement are shown for tasks (ranging from 60.62 to 72.22) and tools (ranging from 66.88 to 74.07), whereas knowledges and resources show lower levels of agreement (35. 83 to 49.64 for knowledge and 36.78 to 78.43 for resources). These levels of agreement are moderate, and indicate that SMEs show some degree of convergence when creating these occupationally-specific skills. The levels of agreement change based on job, with some jobs showing a higher degree of agreement than others. Finally, tasks and tools show a higher degree of agreement than knowledges and resources. While these results are encouraging, especially because only two SMEs were used, additional information about the reliability or agreement between SMEs on the creation of occupationally-specific skills is needed.

Validation

While the evidence of reliability is encouraging, information about the meaningfulness of these groupings is also necessary to establish validity. Some initial validation evidence can be obtained by comparing these SME generated occupationally-specific skills to groupings created empirically. While this sort of comparison does not fully provide evidence for the meaningfulness of the occupationally-specific skills, it does provide some evidence for the appropriateness of the groupings created. If judgments about which tasks should be grouped

together to create an occupationally-specific skill relate to empirically derived task groupings, then we can conclude that the judgments by SMEs provide appropriate categorization.

Six jobs were selected for the purpose of this paper from approximately 325 job analyses performed on enlisted jobs in the U. S. Navy. For these six jobs empirical groupings were then compared with occupationally-specific skill groupings developed by SMEs. The jobs selected include (a) Photographer, (b) Steelworker, (c) Utilitiesman, (d) Public Affairs Manager, (e) Engineering Aid, and (f) Construction Mechanic. The jobs selected represent a wide variety of jobs available in the Navy. The empirical grouping was based on survey data collected from members of the workforce for each of the six jobs. Data collected included (a) percentage of people who perform the task; (b) frequency of performance for each task; and (c) criticality of each task to the job. Table 5 provides information about the total population in each job and the number of job analysis surveys completed. Survey return rates ranged from 30% to 62%.

For each task, one single score, Estimated Task Importance (ETI), was calculated by determining the average frequency and criticality of each task and combining those averages with the percentage of the workforce that performed that particular task. Tasks were also linked to one O*NET skill, an O*NET ability, and an O*NET GWA. The ETI was then linked to the primary skill, primary ability, and general work activity associated for each task. This linkage allowed the assessment of the tasks within the jobs based on the importance of similar skills, abilities, and general work activities.

In order to determine groupings of tasks with similar skill requirements, hierarchical cluster analysis was performed. Hierarchical cluster analysis is a statistical procedure that can be applied to data that exhibits natural groupings (Aldenderfer & Blashfield, 1984). The

purpose of cluster analysis is to organize data into groups that share common characteristics. In this case, cluster analysis was used to group tasks within a job based on the ETI associated with skills, abilities, and general work activities for each task. The resulting clusters were then compared against SME-generated occupationally-specific skills to determine percent overlap between the overall SkillObject and the task clusters. If over 50% of the tasks within a SME generated grouping appeared within the same cluster resulting from the analysis, then it was determined that the SME-generated occupationally-specific skills did show overlap with the task cluster, which provided some evidence of the validity of the SME categorization. The jobs examined exhibited a high degree of overlap, with all jobs examined showing over 60% overlap between SME-generated clusters and analysis-driven clusters (See Table 6).

This provides initial support for the validity using SME judgment when creating occupationally-specific skills. We have compared two different methods of categorizing tasks using different data. SMEs categorized tasks based on their in-depth knowledge of the job. They started by looking at the GWA to which the tasks were assigned, but were not limited to keeping the task groupings within one GWA. SMEs were not provided with data or the ratings of the tasks on criticality, importance, and percent of people that perform each task. The cluster analysis utilized the data collected from the survey to create task groupings.

To further evaluate validity, content was assessed using the Content Validity Ratio (CVR) (Lawshe, 1975). Using this approach, subject-matter experts indicate whether or not a measurement item is essential. The input from the SMEs is then used to compute the CVR. The CVR equation takes on values between -1.00 and +1.00, where a CVR = 0.00 means 50 percent of SMEs believe an item to be essential. Anything greater than 0.00, therefore indicates that more than half of the SMEs believe the item to be essential, and is then considered face valid

(Lawshe, 1975). Further, Lawshe has developed minimum CVRs for different panel sizes that have been based on a .05 significance level. The lower the number of panel size, the higher the minimum CVR. For example, if a panel consisted of 10 SMEs, then the minimum CVR value needed to consider an item valid would be .62.

To calculate Lawshe's CVR, data was collected from 12 SMEs in a Skills Analysts position. These SMEs reviewed the list of 10 occupationally-specific skills generated for this position, and indicated whether the occupationally-specific skill was essential for job performance. Of the ten, all had a CVR of .67 or greater, indicating that all ten occupationally-specific skills are face valid. Six of the occupationally-specific skills, received a CVR of 1.00, indicating 100 percent of the SMEs found the items to be essential, while the other four occupationally-specific skills received a CVR of .83 and .67. The results of this analysis indicate that occupationally-specific skills developed using this procedure have a high degree of content validity, providing further evidence of the validity and meaningfulness of this conceptualization of occupationally-specific skills.

Finally, construct validity was evaluated using convergent and discriminant validity. It was expected that similar occupationally-specific skills would be correlated highly with each other, while occupationally-specific skills that differ would not correlate strongly. Similarity of occupationally-specific skills would be based on the behaviors, knowledge, skills and abilities associated with them. To evaluate convergent and discriminant validity, utilizing the same SkillsAnalyst job, 2 SMEs provided ratings of criticality for each of the 10 occupationally-specific skills, using a five-point scale (1=Not critical and 5=Extremely critical). Table 7 presents the correlation matrix between the 10 occupationally-specific skills for the Skills Analysts job.

A review of the correlation matrix indicates that the pattern of relationships between occupationally-spcific skills is as expected. Occupationally-specific skills such as “Client Management” and “Client Meeting Facilitation”, which we determined to be similar based on the content of the associated tasks, tools, unique knowledges, and resources were significantly correlated (r= .63, p<.05). Similarly, the occupationally-specific skills of “Data Analysis” and “Technical Writing and Reporting” were expected to be correlated because of similar behaviors that are carried-out and the KSAs needed for those occupationally-specific skills, and had a significant (r = .61, p < .05). This pattern suggests convergent validity. To evaluate discriminant validity, correlations between different occupational skills were reviewed. For example, the correlation between “Client Management” and “Data Quality Assurance”, which require different behaviors, tools, knowledge, and resources was not significant (r=-.07). Similarly, The occupationally-specific skill of “Job Analysis” was not correlated with any occupationally-specific skills, which was to be expected because the behaviors, and KSAs associated with this occupationally-specific skill is not similar to the other occupationally-specific skills needed for the job.

These results lend support to the concept of occupationally-specific skills and the procedure described in this paper. While additional reliability and validity information is necessary, these result suggest that SME judgements about occupationally-specific skills are reliable, and that occupationally-specific skills provide a meaninful structure of information about jobs.

Uses of Occupationally-Specific Skill Information

Occupationally-specific skill information can be used for multiple HR functions. In order to create occupationally-specific skills, traditional job analysis information of tasks and

KSAOs must be collected. However, the occupationally-specific skills as described here provide additional information such as information about tools, knowledge, and resources used to perform the specific group of tasks. Occupationally-specific skills also provide a different organization for the same information, focusing on skill requirements and the application of skill within a specific context. Further, occupationally-specific skills are directly linked to general taxonomic information available from O*NET, specifically, Skills, Abilities, and GWAs. Consequently, occupationally-specific skills can be viewed as job specific but also can provide a common language across jobs. This provides flexibility to use this data within a job, across jobs within an organization, or across organizations. Finally, these provide an understanding of the occupationally-specific skills required for successful job performance. Knowledge of these occupationally-specific skill requirements can be used for multiple HR functions ranging from personnel selection to training to career structuring. Figure 2 outlines potential and actual uses of occupationally-specific skill information, some of which will be discussed further.

Training

Occupationally-specific skills can be used for the purpose of training needs analysis. In conducting training needs analysis, Goldstein and Ford (2002) recommend the use of KSAOs that are linked to tasks. The occupationally-specific skill development process outlined here includes both KSAOs (from O*NET) as well as task information. Additional information about KSAOs can be obtained from the list of tools, resources, and knowledges. Occupationally-specific skills may be used to identify training needs by providing a better understanding not just of the global skills needed to perform the job, but specifically how and when skills are applied on the job. Occupationally-specific skills can provide the roadmap of

training requirements. The level of specificity of the skills and the direct link to task groupings make it is possible to use occupationally-specific skills develop job specific training. In addition, it is possible to train the skill in the context of the job. That is, it is possible to design training would develop the general skill needed (i.e., writing), as well as design training that would be specific to the type of writing needed for the job (i.e., administrative writing, scientific writing, writing for a general audience).

By focusing on the application of a skill in a specific context, training can be designed that would facilitate skill acquisition instead of learning a specific task. Skill training, as contrasted to training of tasks allows for more flexible application (Mumford, et al., 1999; Sanchez, 1994). Rapid changes in technology, organizational structures, and jobs, require workers to adapt more quickly to the changing requirements of the job. Tasks may change more rapidly than skill requirements. Skills, even occupationally-specific skills, allow for the learning and application of the skill in a different context. By focusing on skills training, organizations can more efficiently train employees. Skills training will allow employees more rapid adaptation to changing requirements of the job (as long as skill requirements are stable) or easier transfer to jobs with similar skill requirements, even if task requirements are different.

Currently, this methodology is used to identify training needs in the United States Navy. As the Navy environment is continuously changing at a rapid pace, the Navy searched for a way to focus training on skills and still wanted to retain occupational specificity and train in context. Occupationally-specific skills provided the Navy with the ability to design training that is not task based, but is still occupationally-specific. At this point in time occupationally-specific skills have been developed for most enlisted and officer jobs in the

Navy, however, actual changes in training programs as a result of the information from occupationally-specific skill information has not been implemented in the Navy.

In addition to identifying training needs for the creation or modification of training, occupationally-specific skill information can be used to identify when training can be combined across jobs to create efficiency. Because the development of occupationally-specific skills, as outlined here, includes also general taxonomic information such as O*NET skills, abilities and GWAs, similarities across jobs can be identified. By evaluating the similarity of occupationally-specific skills across jobs and job families, training for similar occupationally-specific skills can be combined and more efficiently delivered. In addition, if part of the occupationally-specific skill is unique to a specific job, while others are common across jobs, then specialized training can be created and delivered after the training of the overlapping portions. The similarities in skill requirements can be evaluated in more detail by looking at all the information that an occupationally-specific skill provides. While tasks may be somewhat different, the tools and resources used may be similar, suggesting some overlap.

Using occupationally-specific skills to increase efficiency in training has been undertaken by a group of telecommunications companies in the State of Texas who worked jointly to identify occupationally-specific skills required for Telecommunications Maintenance Technicians. By collecting occupationally-specific skill information from multiple employers, it was possible to identify those occupationally-specific skills that cut across organizations. The data collected resulted in the development of a statewide core curriculum which is offered by community colleges and technical schools. This core curriculum allows the hiring organizations to ensure that individuals graduating from these programs have the skills necessary for effective job performance.

This methodology is also being used by the U.S. Navy to identify training duplications across training centers. Currently, each job family conducts its own training in its own training center. However, there are areas in which functional similarities exist across job families. By reviewing the occupationally-specific skills, similarities across jobs and job families can be identified, and common training is being established where it is appropriate.

Occupationally-specific skills also can be used for the identification of performance gaps, individual training needs, and the creation of Individual Development Plans (IDPs). Instead of listing KSAOs and determining the level of each KSAO an employee possesses, individuals (and their supervisors) can review a list of occupationally-specific skills with the associated tasks, skills, abilities, tools, and knowledges – providing much more detailed information about the specific occupational skill under review. The detailed and specific nature of the occupationally-specific skill allows for easier comprehension both by employees and supervisors compared to a generic KSAO list. The Navy has used this approach by providing an electronic tool called *Mapper*. This tool lists all the occupationally-specific skills required for a job. The sailor and his or her supervisor can use this tool to provide an assessment of the level of proficiency the sailor has on each occupationally-specific skill. Further, because the level of information provided is more detailed, performance gaps may be more clearly identified. That is, while the employee may be able to use most of the tool necessary, or have most of the knowledge required, he or she may be deficient in only one or two. This allows for more precise identification of the training necessary, and providing only the training that is needed.

In addition, in recent years there has been a call to use job analysis information in the creation of licensure and certification exams for various occupations (Raymond, 2001; Wang,

Schmipke, & Witt, 2005). Occupationally-specific skills can provide more detailed information than traditional job analysis that can be used in the development of licensure and certification exams as well as promotional exams. Using traditional methods of job analysis, test content can be specified by identifying tasks, and focusing on those frequently performed and/or critical tasks. Moreover, it is imperative that these tasks be linked to KSAOs, which are at the heart of test development (Wang, Schmipke, & Witt, 2005). Occupationally-specific skills contain all this information, and provide even more specific information about how and under what conditions these tasks are performed and KSAOs used. This provides test developers a better understanding of the occupational skills they need to target in the promotional or certification exams. Furthermore, occupationally-specific skills can provide information about additional certification programs that need to be put in place.

In one such application of occupationally-specific skills, Cisco Systems, a company specializing in internet networking, has used this information to validate the content of existing certification exams and to develop courses and exams to address certification needs not covered by existing courses (Sandall, Reiter-Palmon, & Brown, 2000). Surveys were sent to a sample of Cisco certification holders in the U.S. and abroad. Over 3500 responses were provided, representing a range of jobs in multiple industries, government, education and military. By looking at the list of occupationally-specific skills for various positions requiring Cisco certification, Cisco Systems was able to identify those occupationally-specific skills that were needed and used for each position. This information, in turn, was then mapped onto the content of the certification courses. Gaps were revealed in the occupational-skill requirements and what certification was provided. Based on this information, Cisco Systems added a new certification program Cisco Certified Internetwork Expert.

Placement

Occupationally-specific skills can be used to facilitate placement decisions. Occupationally-specific skills can be generated for each job in the organization, allowing for comparison across jobs. In addition, just as discussed for IDPs, individuals and their supervisors may rate proficiency on each skill. Further, it is possible to allow individuals access to information regarding occupational skills from other occupations and have them rate their proficiency on those. More effective matching of individuals to jobs can be obtained by mapping the proficiency of the individual to the occupational skill demands of the job. Using this system provides not only knowledge about occupationally-specific skills tied to the job the incumbent currently holds, but also allows the organization to identify additional occupationally-specific skills possessed by the individual that may not be needed in the current position. This information then can be used in making placement decisions.

An additional benefit of using occupational skills for placements is in developing project teams. Many organizations are moving toward a structure that includes more teams, some for specific projects (Illgen, Hollenbeck, & Johnson, 2005). With the increased use of project teams, identification of team members with complimentary skills is necessary. While some occupationally-specific skills may be identified based on the position the person is occupying, some needed skills may not be used in the current position. If the organization has an inventory of proficiency on all occupational skills needed, then matching individuals to project needs becomes easier. Such a system can identify the most effective team, one that would allow some overlap in necessary skills, while still maximizing the diversity of skills present in the team. Teams with such a composition have been found to be more effective (Illgen, et al., 2005; Van der Vegt & Van de Vliert, 2005).

Pay and Bonuses

Using occupationally-specific skills allows the organization to evaluate its pay structure and its alignment with employee skills both inside the organization and in comparison with other organizations. Skill-based pay is gaining in popularity (Lawler, 2000), and information about occupational skills can point to critical skills necessary for the job or for movement within the organization (either a promotion or lateral moves). Organizations are able to reward employees who show proficiency or master these targeted occupational skills. In addition, this occupational skill information can be used to identify similar occupations in other organizations. The U.S. Navy has used occupationally-specific skills to compare salaries of its Information Technology (IT) personnel with comparable civilian jobs (Garcia, Gasch, & Wertheim, 2002). This comparison allows the Navy to provide more comparable salaries to their civilian counterparts in an effort to prevent turnover.

Performance Evaluation

Occupationally-specific skill information can also be used in the development of performance evaluation instruments and performance standards. Specific performance standards can be developed using the more detailed information presented by the occupationally-specific skill, including tasks, tools, knowledges, and resources. Other approaches to performance evaluation which focus on individual characteristics (as opposed to specific behaviors), such as graphic rating scales, suffer from ambiguity, which can lead to rating errors (Cascio, 1998). Using occupationally-specific skill information instead allows more detailed information to be presented to the rater as to what specifically indicates the skill, creating less ambiguity and increasing the accuracy of the ratings.

Further, specific performance standards can be identified based on the information provided in the occupationally-specific skills. These performance standards can provide not only a more accurate way to evaluate performance, but also will allow the organization to base employee pay and bonuses on the demonstrated level of the occupationally-specific skill. The U.S. Navy has started a program to identify performance standards associated with multiple occupations. These performance standards are developed to reflect what is considered expected as well as exemplary performance for each occupationally-specific skill. Performance standards provide a behavioral anchor for the occupationally-specific skills, and link the behavior as well as the occupationally-specific skill to specific outcomes. These performance standards can be used not only in performance evaluation measures, but also to evaluate training outcomes.

Personnel Selection and Promotion

Identification of the KSAOs necessary for effective job performance is at the heart of personnel selection. Occupationally-specific skills allow the identification of general skills and abilities necessary for job performance. Research by Jeanneret and Strong (2003) has shown that O*NET GWAs can be linked to predictors such as the General Aptitude Test Battery (GATB). However, the occupationally-specific skills described here also allow researchers and practitioners in personnel selection to move beyond these general skills and abilities. Previous research has shown that tests which are more job specific, have higher face validity, show less adverse impact, have better reactions from applicants, and typically show equivalent psychometric properties to more general tests (Chan & Schmitt, 1997; Klinger & Schuler, 2004; Schmitt & Mills, 2001). This is true for both cognitive ability tests written to

reflect more job specific information as well as work samples, assessment centers, and situational judgment tests.

Given the positive effects of more job specific tests, occupationally-specific skills can be used in the development of tests that would more accurately reflect the behaviors, skills, abilities, tools, and knowledges used on the job. This information can also be used to develop behaviorally-based interview questions, simulations, and situational judgment tests, with high fidelity. The State of Oklahoma is currently using a behaviorally-based interview system that was developed based on O*NET skills. These interview questions target the broad O*NET skills and can be applied across multiple jobs. However, questions can also be tailored for specific jobs and specific context and allow easily for the targeting of occupationally-specific skills. The availability of occupationally-specific skills allows for the generation of behaviorally based interview questions that target the actual context in which the skill will be applied. This allows for more specific and narrow questions that are more job relevant. A similar approach can be used when developing simulations or situational judgment tests. The broad O*NET skills and ability provide the general KSAOs requirement, whereas the occupationally-specific skill allows tailoring the question or the simulation to the specific situation and context.

Further, because of the link to higher order skills and abilities, these types of measures can easily be modified for positions which have the same or similar clustering of skills and abilities. The same item or test question can be used if a high degree of similarity exists between the occupationally-specific skills, while modifications may be required if the occupationally-specific information varies. Existing commercial tests also can be mapped to occupationally-specific skills by linking these tests to the O*NET skill and abilities in an

approach similar to that taken by Fleishman and Reilly (1992). Finally, occupationally-specific skills can provide the road-map for test development. The comprehensive nature of the occupationally-specific skills as developed here allows for the development of knowledge and procedural items that are linked to tasks, tools, knowledge and resources. Content validity can be established directly through links to occupationally-specific information contained in the occupationally-specific skills.

Career Structure

Perhaps one of the most important benefits to an organization resulting from occupationally-specific skill information is a better career management system. By identifying occupationally-specific skills across jobs, job families can be better identified. Accurately identifying job families is critical for several HR functions such as career development and progression, training, and compensation (Pearlman, 1980). Previous work has determined that job families can be similarly identified using either task or ability information (Hartmen, Mumford & Muller, 1992). However, Sackett (1991) has found that the level of specificity of the information used to determine job similarity and difference will affect how jobs are clustered into job families. By using occupationally-specific skills to identify similarities and differences between jobs, a more accurate identification of job families may emerge, as both job specific and detailed information is available as well as broader general information. Moreover, the more detailed understanding of the occupationally-specific skills required for each job in the job family provides employees with a better understanding of what is required for lateral moves or promotions. Employees, therefore, are able to be responsible for their own development and prepare themselves for the next job. This system for the identification of job families currently is being developed for the U.S. Navy. By using occupationally-

specific skills, it was possible to identify similar jobs that can be combined into one rating or job family, and create job families that would allow for clearer career paths. The identification of job similarities occurred through survey ratings on tasks, tools, knowledges, and resources, as well as links to O*NET skills, abilities, and GWAs. Job similarity was then identified both by judgment of similar occupationally-specific skills and empirically by survey rating information which indicated similar tasks, tools, knowledges, and resources. Further, data was available through linking this survey information to the O*NET skills and abilities based on the occupationally-specific skill information. The identification of these job families allowed the creation of career paths and promotion possibilities, which was especially important for jobs which before were not linked to a specific career path.

Conclusion

This paper provided a detailed description of the development of occupationally-specific skills, based on O*NET and information gathered from job analysis efforts. Occupationally-specific skills were defined as narrower skills or in other words, the application of broader skills in a specific performance domain. In this paper we have detailed the need for occupationally-specific skills in the current workplace environment. Occupationally-specific skills provide organizations with an understanding of the worker oriented characteristics of the job that are job specific, but are also tied to broader job characteristic due to link to the general taxonomies of O*NET (GWAs, skills, and abilities). This approach to understanding jobs is relatively new and provides some advantages that are not possible using work oriented approaches or the broader skills and abilities taxonomies alone to describe worker oriented information.

To address this need for occupationally-specific skill information, we have presented a procedure for the development of occupationally-specific skills. Using this procedure, tasks are

grouped in meaningful groups, and additional occupationally-specific information about tools, unique knowledges, and resources are included. Finally, since tasks are linked to O*NET skills and abilities taxonomies, occupationally-specific skills include information about general taxonomies as well. Initial information about the reliability of the procedure and resulting judgments, as well as initial validation evidence has also been presented.

Finally, the paper concludes with a detailed description of the possible uses of occupationally-specific skill information for training, personnel selection and advancement, placement, performance evaluation, pay and bonuses, and career development. Within each area, the use of occupationally-specific skill information was described and examples of it application, specifically for the military environment, were provided.

While occupationally-specific skills provide multiple benefits, several caveats should be considered. First, the procedure described here provides a subjective approach, based on SME judgments for the creation of occupationally-specific skills. Even though this concept can be viewed as a progression from the well-documented O*NET system, and has support from theory and existing research, the present article should be treated as an initial effort that needs to be further evaluated. Second, while evidence of reliability and validity have been presented here, they should be treated as preliminary. Additional evidence for the reliability of SME judgments and validity of the construct should be gathered in future research. Finally, the utility of occupationally-specific skills in the application described here should be evaluated.

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Table 1

*The O*NET Taxonomy of Skills*

Basic Skills	Content Skills	1.	Reading Comprehension	Understanding written sentences and paragraphs in work related documents.
		2.	Active Listening	Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
		3.	Writing	Communicating effectively in writing as appropriate for the needs of the audience.
		4.	Speaking	Talking to others to convey information effectively.
		5.	Mathematics	Using mathematics to solve problems.
		6.	Science	Using scientific rules and methods to solve problems.
	Process Skills	7.	Critical Thinking	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions approaches to problems.
		8.	Active Learning	Understanding the implications of new information for both current and future problem-solving and decision-making.
		9.	Learning Strategies	Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.
		10.	Monitoring	Monitoring/assessing performance of yourself, other individuals, or organizations to make improvement or take corrective action.
Cross Functional Skills	Social Skills	11.	Social Perceptiveness	Being aware of others' reactions and understanding why they react as they do.
		12.	Coordination	Adjusting actions in relation to others' actions.
		13.	Persuasion	Persuading others to change their minds or behavior.
		14.	Negotiation	Bringing others together and trying to reconcile differences.
		15.	Instructing	Teaching others how to do something.
		16.	Service Orientation	Actively looking for ways to help people.
	Complex Problem Solving Skills	17.	Problem Identification	Identifying the nature of problems.
		18.	Information Gathering	Knowing how to find information and identifying essential information.
		19.	Information Organization	Finding ways to structure or classify multiple pieces of information.
		20.	Synthesis Reorganization	Reorganizing information to get a better approach to problems or tasks.
		21.	Idea Generation	Generating a number of different approaches to problems.
		22.	Idea Evaluation	Evaluating the likely success of an idea in relation to the demands of the situation.
		23.	Implementation Planning	Developing approaches for implementing an idea.
		24.	Solution Appraisal	Observing & evaluating the outcomes of a problem solution to identify lessons learned or redirect efforts
	Technical Skills	25.	Operations Analysis	Analyzing needs and product requirements to create a design.
		26.	Technology Design	Generating or adapting equipment and technology to serve user needs.
		27.	Equipment Selection	Determining the kind of tools and equipment needed to do a job.
		28.	Installation	Installing equipment, machines, wiring, or programs to meet specifications.
		29.	Programming	Writing computer programs for various purposes.
		30.	Testing	Conducting tests to determine whether equipment, software, or procedures are operating as expected.
		31.	Operations Monitoring	Watching gauges, dials, or other indicators to make sure a machine is working properly.
		32.	Operation and Control	Controlling operations of equipment or systems.
		33.	Product Inspection	Inspecting and evaluating the quality of products.
		34.	Equipment Maintenance	Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
		35.	Troubleshooting	Determining causes of operating errors and deciding what to do about it.
		36.	Repairing	Repairing machines or systems using the needed tools.
	Systems Skills	37.	Visioning	Developing an image of how a system should work under ideal conditions.
		38.	Systems Perceptions	Determining when important changes have occurred in a system or are likely to occur.
		39.	Identification of Downstream Consequences	Determining the long-term outcomes of a change in operations.
		40.	Identification of Key Causes	Identifying the things that must be changed to achieve a goal.
		41.	Judgment and Decision Making	Considering the relative costs and benefits of potential actions to choose the most appropriate one.
		42.	Systems Evaluation	Looking at many indicators of system performance, taking into account their accuracy.
	Resource	43.	Time Management	Managing one's time and the time of others.
		44.	Management of Financial Resources	Determining how money will be spent to get the work done, and accounting for these expenditures.

Management Skills	45.	Management of Material Resources	Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.
	46.	Management of Personnel Resources	Motivating, developing, and directing people as they work, identifying the best people for the job.

Table 2

Comparison of Occupationally-Specific Skill Information between Two SMEs

Occupational Skill	Business Development	Business Development
Tasks	Determine client goals and potential uses of data Develop relationships with clients Explain data and system benefits to client for future business development Present executive briefings to client groups for project review and business development	Confer with client managers, instructors, or customer representatives on data collection and use Determine client goals and potential uses of data Develop relationships with clients Explain data and system benefits to client for future business development Present executive briefings to client groups for project review and business development
Tools	Academic Journal Search Engine Computer Microsoft Powerpoint Microsoft Word	Computer Microsoft Powerpoint
Knowledge	Business development techniques Customer Management techniques Data usability Presentation development principles Presentation techniques SkillObject data benefits	Business development techniques Customer Management techniques Data usability Presentation development principles
Resources	*None*	*None*

Table 3

Agreement between SMEs on Occupationally-Specific Skills Across Components for the Positions of Skills Analyst, Senior Skills Analyst, and Skills Compliance Officer

Position	% Agreement across all componenets
Skills Analyst	48.61
	59.38
	71.11
	21.36
	75.34
	78.16
	52.90
	55.00
	39.58
	75.49
Total Skills Analyst	57.69
Senior Skills Analyst	55.58
	60.92
	55.04
	35.02
	66.15
	14.82
Total Senior Skills Analyst	47.92
Skills Compliance Officer	87.08
	61.79
	75.00
	48.75
	79.17
	75.00
	83.54
	61.04
	83.33
Total Skills Compliance Officer	72.44

Table 4

Agreement between SMEs on Components for the Positions of Skills Analyst, Senior Skills Analyst, and Skills Compliance Officer

Position	Componenet	Agreement
Skills Analysts	Tasks	60.62
	Tools	74.07
	Knowledge	52.67
	Resources	43.40
Senior Skills Analysts	Tasks	65.88
	Tools	66.88
	Knowledge	35.83
	Resources	36.78
Skills Compliance Office	Tasks	74.84
	Tools	72.22
	Knowledge	57.00
	Resources	78.43
Overall	Tasks	66.96
	Tools	71.50
	Knowledge	49.64
	Resources	53.74

Table 5

Population and Return Rates for 6 Jobs Used in SkillObject Validation

Job Title	Population	Returned	% Returned
Photographer	962	437	45
Steelworker	797	260	33
Utilitiesman	1006	324	32
Public Affairs Manager	668	414	62
Engineering Aid	332	131	39
Construction Mechanic	1608	490	30

Table 7

Task Cluster and SkillObject Percent Overlap for Six Jobs

Job Title	**Percent Overlap**
Photographer	83.33
Steelworker	83.33
Utilitiesman	64.29
Public Affairs Manager	63.63
Engineering Aid	100.00
Construction Mechanic	100.00

Table 6

Correlations between Skills Analyst Occupationally-Specific Skills

Occupational Skill	1	2	3	4	5	6	7	8	9	10
Client Consultation	-	.51	.44	-.57	.50	-.23	.60*	.50	.60*	.04
Client Management		-	.60*	-.17	.55	-.34	.34	.63*	-.07	.32
Data Analysis			-	.10	.62*	.04	.61*	.71*	-.08	.61*
Internal Comm.				-	.26	.44	.09	.26	-.16	.57
Training & Develop.					-	.33	.85**	.93**	.48	.70*
Job Analysis						-	.18	.07	.11	.17
Proj. Mgmt & Admin.							-	.85**	.54	.66*
Client Meeting Facil.								-	.36	.70*
Data Quality Assurance									-	.64
Technical Writing & Reporting										-

* $p < .05$, ** $p < .01$

Figure 1 - Example of SkillObject

Figure 2 – Uses of SkillObject Data

Job: Photographer (Military)

Occupationally-Specific Skill: Broadcast Management

Tasks:

Demonstrate digital imagery editing techniques
- GWA: Guiding, Directing, and Motivating Subordinates
- Primary Skill: Instructing
- Primary Ability: Speech Clarity

Ensure compliance with release of accident and incident information
- GWA: Evaluating Information to Determine Compliance With Standards
- Primary Skill: Monitoring
- Primary Ability: Written Comprehension

Prepare public service and informational display advertisements for command publications
- GWA: Thinking Creatively
- Primary Skill: Information Organization
- Primary Ability: Fluency of Ideas

Respond to audience complaints
- GWA: Resolving Conflicts and Negotiating With Others
- Primary Skill: Negotiation
- Primary Ability: Oral Expression

Tools

Inventory management software
News management software
Internet browser
Communications equipment
Office equipment
Microsoft office suite
Computer peripherals
Production music and sound effects CD library
Printer

Unique Knowledge

Administrative procedures
Culture
Economics and accounting
Public safety and security
Customer and personal service

Resources

Dictionary
DODD 5400.13 Joint Public Affairs Operations
Navy Public Affairs Handbook
Thesaurus
Writing Style Guide

Job: Builder (Military)

Occupationally-Specific Skill: Embarkment Operations

Task:

Coordinate unit embarkation
- GWA: Coordinating the Work and Activities of Others
- Primary Skill: Management of Material Resources
- Primary Ability: Oral Expression

Perform Maritime Prepositioning Force (MPF) operations
- GWA: Implementing Ideas, Programs, Systems or Products
- Primary Skill: Operation and Control
- Primary Ability: Information Ordering

Perform unit embarkation
- GWA: Controlling Machines and Processes
- Primary Skill: Operation and Control
- Primary Ability: Information Ordering

Coordinate mobilization preparations
- GWA: Coordinating the Work and Activities of Others
- Primary Skill: Monitoring
- Primary Ability: Information Ordering

Tools:

Automated Aircraft Load Planning System (AALPS)
Cargo Scales
Embarkation Tools
Marine Air Ground Task Force (MAGTF) Computer Aided Embarkation Management System (CAEMF)

Unique Knowledge:

Marine Air Ground Task Force (MAGTF) Deployment Support System
Maritime Pre-Positioning Force (MPF) Arrival and Assembly Operations
Maritime Pre-Positioning Force (MPF) Planning for the Naval Construction Force
Maritime Pre-Positioning Force (MPF) Staff Planning

Resources:

Title 29, Code of Federal Regulations, Part 1926 (29 CFR 1926)
MCWP 4-12 Operational Level Logistics
NAVFAC MO-403 Navy Drivers Handbook
NWP 4-04.1 Seabee Operations in the MAGTF
COMSECONDNCB-COMTHIRDNCBINST 5100.1A, NCF OSH Manual
MCDP 5 Planning
MCWP 4-1 Logistics Operations

Job: Navigation Specialist (Military)

Occupationally-Specific Skill: Display/Console Operations

Tasks:

Operate informational display systems
- GWA: Controlling Machines and Processes
- Primary Skill: Operation and Control
- Primary Ability: Deductive Reasoning

Configure radar set equipment
- GWA: Implementing Ideas, Programs, Systems, or Products
- Primary Skill: Technology Design
- Primary Ability: Information Ordering

Assign symbology to radar contacts
- GWA: Drafting, Laying Out, and Specifying Technical Devices, Parts, or Equipment
- Primary Skill: Information Organization
- Primary Ability: Deductive Reasoning

Tools:

Vision enhancement equipment
Navigation tools
Range finding equipment
Navigation equipment

Unique Knowledge:

Command and control fundamentals

Resources:

NAVEDTRA 14338, Quartermaster

Job: Utilitiesman (Miliary)

Occupationally-Specific Skill: Water Treatment

Tasks:

Install water treatment systems
- GWA: Implementing Ideas, Programs, Systems, or Products
- Primary Skill: Installation
- Primary Ability: Gross Body Coordination

Operate water treatment systems
- GWA: Controlling Machines and Processes
- Primary Skill: Operation and Control
- Primary Ability: Control Precision

Tools

Precision measuring equipment (PME)
Hand tools
Hilti gun
Test equipment
Cutting and welding equipment

Unique Knowledge

Electrical theory
Building construction
Confined space hazards
Engineering and technology
Environmental regulations
Instrumentation and controls
Mechanical theory
Chemistry

Resources

Asse Cross Connection Code
Fuel Gas Code
Plumbing Code

Job: Naval Flight Officer

Occupationally-Specific Skill: Tactical Mission Planning

Tasks

Analyze oceanograpic conditions of mission area
- GWA: Monitoring Processes, Materials or Surroundings
- Primary Skill: Information Organization
- Primary Ability: Deductive Reasoning

Analyze pre-flight information to maximize mission effectiveness
- GWA: Analyzing Data or Information
- Primary Skill: Information Organization
- Primary Ability: Deductive Reasoning

Analyze tactical conditions in which aircraft will operate
- GWA: Monitoring Processes, Materials or Surroundings
- Primary Skill: Information Organization
- Primary Ability: Deductive Reasoning

Establish mission objectives
- GWA: Developing Objectives and Strategies
- Primary Skill: Judgment and Decision Making
- Primary Ability: Fluency of Ideas

Analyze meteorological conditions in which aircraft will operate
- GWA: Monitoring Processes, Materials or Surroundings
- Primary Skill: Information Organization
- Primary Ability: Deductive Reasoning

Coordinate crew duties and responsibilities
- GWA: Coordinating the Work and Activities of Others
- Primary Skill: Coordination
- Primary Ability: Oral Expression

Operate communications equipment:
- GWA: Controlling Machines and Processes
- Primary Skill: Operation and Control
- Primary Ability: Control Precision

Operate Computer Network Operations (CNO) Systems
- GWA: Working with Computers
- Primary Skill: Operation and Control
- Primary Ability: Control Precision

Perform tactical mission planning procedures
- GWA: Organizing, Planning and Prioritizing Work
- Primary Skill: Critical Thinking
- Primary Ability: Category Flexibility

Tools

Computer
Diagnostic tools
Encryption software
SIPRNET

Unique Knowledge
Aeronautical chart interpretation
Crew coordination
Flight clearance
Mission planning
Rules Of Engagement (ROE)

Resources
Air Tasking Order (ATO)
Aircraft NATOPS Manual
JCAS (Joint Close Air Support) Manual
Range manuals
Special Instructions (SPINS)
Squadron Operating Procedures
TOPGUN Manuals
Navigational Charts

Strategic Applications of SkillObjects Data