

# Occupational Analysis

Occupational analysis (OA) is about building, maintaining, and restructuring organizations. This goal necessitates having reasonably well-defined jobs which will accomplish the organization's mission when staffed by properly screened and trained personnel. Because OA takes a long-term, career-path perspective, it surveys personnel from entry-level positions up through senior personnel. In OA, target personnel are in a given career field (job family), not just the current workers in a specific job classification. Success in this discipline requires measuring and relating relevant attributes of both people and jobs to arrive at optimal person-job-match algorithms. The focus in OA shifts from the people to the job requirements, and finally to the quality of the person-job match in the actual work setting.

## People Factors

Recruiting is a key point in the personnel life-cycle and tends to be people-centered. Metrica has analyzed the occupational/career choice issue throughout its history. Metrica used nation-wide survey data to develop prediction models of the propensity of the youth population to select various occupations. Such prediction models have been used to determine population estimates of youth intending to enlist in military service, join the workforce, or enter college. Metrica has a unique perspective and understanding of the dynamics behind large organization recruiting models due to this work, along with other recruiting analysis projects for the United States Air Force (data ranging from 1985-1996) and the Internal Revenue Service (1993-1995). In developing prediction models, Metrica uses advanced analytic techniques spanning from traditional General Linear Models (GLM) through state-of-the-art techniques including nonlinear neural network methods and policy specifying techniques.

Attitude is another person-centered factor that can affect job performance in addition to aptitude and training. Metrica has been involved in cutting-edge research to assess the impact of personality on job performance. Metrica not only created the official baseline "self-report" personality data bases across enlisted and officer populations for the Air Force, Metrica also surveyed pilots and navigators about critical incidents occurring during Operation Desert Storm to identify the impact of personality factors under stress. More recent studies have combined task-level job analysis with attitude and personality items to help isolate and correct the real sources of job satisfaction to retain highly trained personnel in a rapidly shrinking force.

## Job Requirements

Beyond the person-centered factors, responsible occupational analysis must identify and document actual job requirements. Past experience has shown that the task-level definition of jobs can provide a common platform for coordinating a host of personnel management requirements. Routine analysis accomplishes two important functions. First, task-level OA documents the actual work, its structure and distribution allowing for quick assessment of restructuring which may be required in the current classification system. If classification structures don't match training and/or career progression methods exist to assist in projecting classifications more consistent with organization needs (Job Structuring Technology: JST).

Second, task-level OA spans entry level to senior workers which permits responsible programming of career ladder perspectives in training and certifications required. Task-level data permit analysis of existing courses and specification of mastery content for projected courses with recommended weighting for course content outlines. By associating task-level items with test outlines, recommended weights may be given for test outlines (Automated Test Outlines: ATOs). By associating task-level items with units of a training package or items on a test, recommended emphasis (based on job requirements) may be

assigned to those units and item types. If recommended weights on existing tests or training programs do not match current scoring logic, one has the basis for rebalancing the assessment instrument or formally documenting the rationale for the differing perspectives (Job-Linked Assessment Procedures: J-LAP - developed in conjunction with a survey of the Taxpayer Assistor job family in 1991).

Over and above routine studies, special management/research studies have included:

- Manpower substitutability between apprentice and journeyman personnel,
- Comparability of occupational survey data (collected in various modes) with maintenance repair data bases or other external sources,
- Targeting job-specific tasks for job performance research or cognitive task analysis,
- Creating a Benchmarked Occupational Learning Difficulty (BOLD) across career fields,
- Comparison of knowledge test scores to ratings of job proficiency by supervisors.

## **Person-Job Match Issues**

Depending on the organizational goals and human resource practices, some agencies routinely mix task-level job surveys with other kinds of items to achieve specific purposes. These other applications have included:

- Hybrid job-attitude surveys to monitor job satisfaction, establish selection screening instruments and/or determine causes of high turnover rates,
- Determination of Competencies, Knowledge, Skill, Ability, and Other (KSAO) requirements, Principles, Tools, Sources of Information, or other non-task job dimensions,
- Performance measurement specifics for performance appraisals.

## **Professional Analysis Tools**

The most widely used software package for large-scale job-task analysis is the Comprehensive Occupational Data Analysis Programs (CODAP) system. The CODAP system a software tool used for organizing, documenting and analyzing personnel utilization, classification structures, job requirements, training requirements, skills management, staffing levels, manpower analysis, job evaluation and ad hoc management studies. While external analyses may be accomplished in SPSS or Stata for particular projects, the CODAP system is the primary tool to input, organize and orchestrate task-level data. CODAP's hierarchical clustering is used for organizing job incumbent data into coherent jobs types and their tasks into job performance dimensions known as modules. CODAP's Interrater reliability is used with ratings of Subject Matter Experts (SMEs) to discern the dominant policy and identify outlier items (tasks) and outlier SMEs (raters). When panels of SMEs are used, non-CODAP programs for policy capturing and policy specifying are used to assess agreement and, when necessary, focus on areas of disagreement to expedite interactively forging a common policy.

CODAP has been used as a basis for job and task analysis of large organizations by a variety of users. Metrica staff members have worked with the following user organizations throughout their professional careers: all branches of DoD (U.S. Army, Navy, Marines, and Air Force), the United States Coast Guard, the National Security Agency (NSA), the Federal Bureau of Investigation (FBI), the Office of Personnel Management (OPM), the Internal Revenue Service (IRS), U. S. Department of State, Federal Aviation Agency (FAA) state and local governments (Hennepin County, City of Minneapolis, City of Fort Worth, Unified Los Angeles School District, etc.), universities (the Maryland Center for Productivity & Quality of Working Life, Florida State University, Graduate School of Business at the University of Texas at Austin, the Ohio State University, etc.) and a number of quasi-governmental or private companies (the Institute for Nuclear Power Operations, Control Data Corporation, American Telephone and Telegraph, etc.).