Placement Opportunities for Human Factors Engineering and Ergonomics Professionals Part II: Industry, Government/Military and Consulting Positions

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During the period from November 1995 through October 1996, the Placement Service of the Human Factors and Ergonomics Society distributed announcements describing 195 positions available for human factors engineers and ergonomics professionals. This paper describes placement opportunities for HFE and ergonomics professionals in industry, government /military and consulting positions (N=162), while an overview of all advertised positions, and a description of academic (N=8) and internship positions (N=25) is provided in Part I (Moroney, Proulx & Parker, 1997). The attributes of the position descriptions examined include: degree requirements, major field of study, industrial sector, areas of expertise, required work experience, salary, geographic location, job description and skills required.

Fifty-seven percent of the positions describe the masters degree as the minimum requirement, with 18% of the opportunities in the consulting sector. The area of expertise most frequently requested (69%) was HCI, with test and evaluation (specifically usability testing) being specified for 44% of the positions. The most frequently cited (35%) primary area of responsibility was interface design.

During the period from November 1995 through October 1996, the Placement Service of the Human Factors and Ergonomics Society (HFES) distributed announcements describing 195 positions available for human factors and ergonomics (HF&E) professionals. Employers completed a "Job Listing" form, provided by the HFES Placement Service, on which they provided information on a variety of factors including: degree requirements, major field of study, areas of expertise, required work experience, geographic location, job description, employment sector and skills required. The analysis of these data is the basis for this article. Please note that this analysis is not a complete listing of all the positions available to HF&E professionals. Related positions are also listed with other professional placement services.

This paper describes placement opportunities for HF&E professionals in industry, government/ military and consulting positions (N=162), while an overview of all advertised positions, and a description of academic (N=6) and internship positions (N=28) is provided in Part I (Moroney, Proulx, & Parker, 1997).

Placement Opportunities by Sectors

The 162 positions discussed in this paper were categorized into three employment sectors: industry (69.7%), government/military (11.7%), or consulting (18.5%). The number of positions available in industry increased by 31% from 86 during 1994-1995 to 113 during 1995-1996. The positions were further classified according to industrial sector (see Figure 1). Industrial sector was based on the type of industry submitting the position announcement. Some classifications were made easily (Boeing: aviation/aerospace: GM: automotive). Positions in organizations which employ human factors specialists and ergonomists as consultants in a variety of areas (Carlow, Humantech) were classified as consulting organizations. While organizations that supplied consultants in specific areas (insurance/risk management: Liberty Mutual) were classified by the specific area. Most (18%) of the positions were as consultants, with aviation/aerospace ranking second with 13%. As will be seen later in the data, Human Computer Interaction (HCI), contributed to almost all sectors. The descriptions of 6 positions were too ambiguous to classify into a specific industry and thus comprise the category "other". Interestingly, a strong growth area, telecommunications, represented less than 7% of the position opportunities. This 6% decrease from last year (Moroney & Adams, 1996) may indicate that the demand in that sector has been met, at least for now. On the other hand, the number of positions available in aerospace is almost three times what it was last year. Readers should note that while comparisons with the 94-95 data will be made, these comparisons should not be interpreted as a trend, since they represent only two data points.

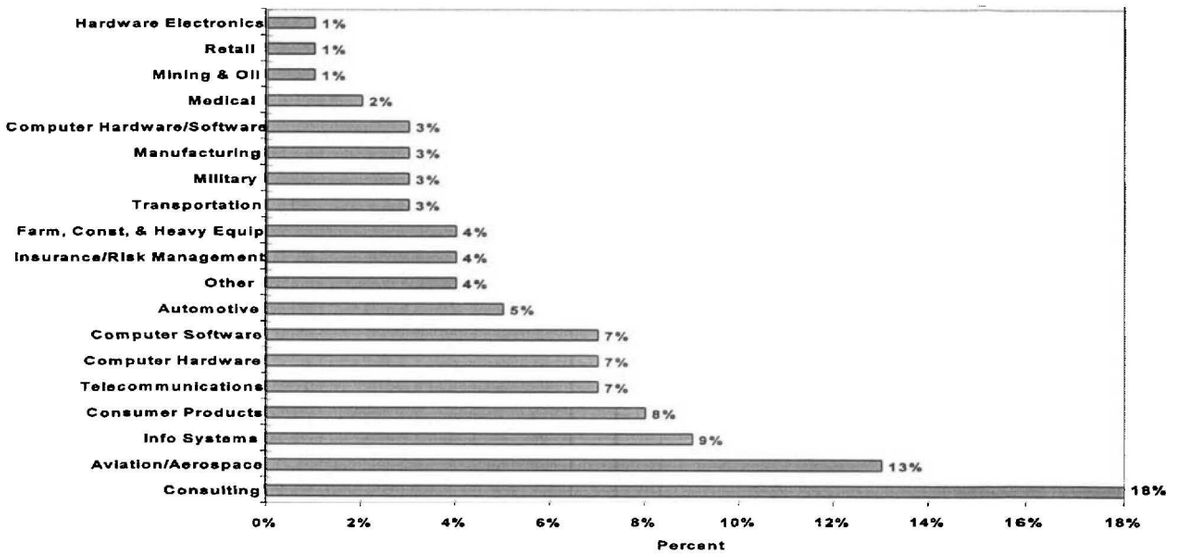

Figure 1. Placement opportunities in the industrial sector by type of industry (N=159)

Minimum Degree and Minimum Years Experience

With respect to the minimum degree requirements, master and bachelor degrees were requested for 94.5% of these positions, with the masters degree being specified for 57% of the 162 positions. Table 1 provides a more detailed description, broken into type of degree by employment sector. The consulting sector, with 29 positions, required the most experience at the doctoral level (median 5 years). Industry had two doctoral positions available for the development and usability testing of communication devices, and in the development of interfaces for construction equipment, The five doctoral positions available in the government/military sector were for positions with the FAA, NTSB, or in developing medical devices. A median of 1 year of experience (range 0-8 years) was expected for these positions. In the consulting sector, individuals with doctorates were sought for work in HCI and accident data analysis.

Table 1

Years of Experience and Degree Required for Each Employment Sector

Employment Sector*	Degree Required	Years of Experience Desired	
		Median	Range
Industry (N=114)	Bachelor (N=47) Master (N=65) Doctorate (N= 2)	2.0 2.0 2.5	1-3 0-3 0-5
Consulting (N=29)	Bachelor (N=10) Master (N=17) Doctorate (N= 2)	1.0 2.0 5.0	0-1 1-3 0-10
Govt.../Military (N=19)	Bachelor (N= 4) Master (N=10) Doctorate (N= 5)	2.0 0.5 1.0	1-3 0-1 0-8

* For the purposes of this table, Employment Sector was based on the choice selected by the organization placing the position announcement.

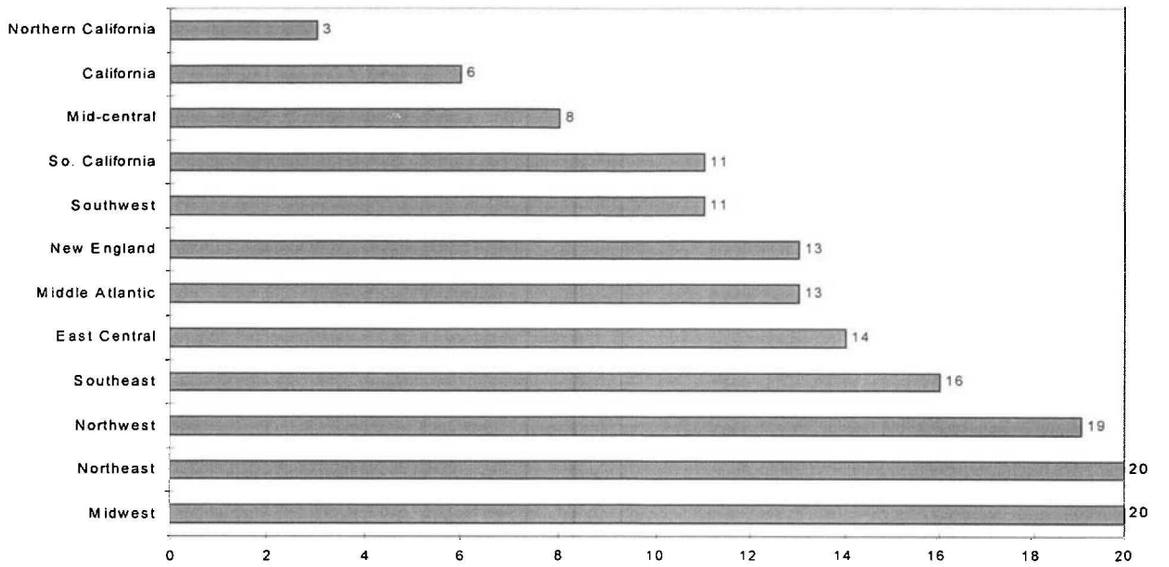

Figure 2. Geographical locations of placement opportunities for Industry, Govt/Mil, and Consulting positions. (Positions with N's of 2 or less are not shown)

Salary & Geographical Location

Eighty-seven percent of the employers described the salary range as negotiable. Within the 21 positions for which salary was specified, the salaries ranged from a low of $30,000 to a high of $93,000. The median salary in industry ranged from $40 to $60,000, academia ranged from $42 to $45,000, government/military ranged from $42 to $65,000, and consulting ranged from $42 to $55,000. Readers interested in additional details on salary are advised to consult the salary survey conducted by Sanders (1993) and correct for inflation. Taylor and Hardy (1996) provide information about salaries of psychologists in general but don't specifically address HF&E positions.

The greatest concentration of positions available was in the Northeast (n=20) and Midwest (n=20). The State of California also had a total of 20 positions. Followed by the Northwest and Southeast with 19 and 16 positions respectively. In last years survey, only three positions were located in New England and four in the Midwest. However, this year 13 positions are located in New England and 20 in the Midwest. Two positions were available with a major computer system developer at a variety of locations throughout the United States.

Areas of Expertise & Responsibility

Employers were allowed to specify up to six areas of expertise needed for each position. Because these areas of expertise were not prioritized, it was impossible to assess the primary needs of the employer. Figure 3 specifies the number of requests for a particular expertise. The majority were in the area of HCI, followed by test and evaluation and industrial ergonomics. It should be noted that positions indicating a need for expertise in test and evaluation (T&E) often included comments about usability testing of computer based products. Thus the areas reported are not mutually exclusive. Areas of expertise with less than seven entries were not reported. These included MANPRINT (n=6), aging (n=4), environmental design (n=4), human performance (n=3), biomechanics (n=2), individual differences (n=2), medical information systems (n=2), and workstation design (n=2).

In many cases, the position title was not specified, or general terms such as HFE, ergonomist or manager were used. In addition, terms as different as usability designer, usability specialist, user interface designer, and application architect were used to describe positions which required an individual who could

develop graphical user interfaces (GUIs). The narrative portion of the announcements were reviewed and each position was placed in a single category which reflected the primary area of responsibility for that position (see Figure 4). As was reported by Moroney and Adams (1996), the greatest demand was for software interface designers. There were three categories of interface designers: designers with GUI, HCI, or graphics expertise (n=56), interface designers for both software and hardware (n=9) and hardware interface designers (n=3).

Other Skill Requirements

Many basic "tools" are expected to be in the HF&E professional toolbox. The tools most often cited in these announcements include: a working knowledge of usability techniques, proficiency with rapid prototyping tools, the ability to conduct user need assessments, basic research skills, and a working knowledge of testing and evaluation techniques. Within the software industry, many employers required computer programming skills (e.g. 27 announcements specified experience with Visual Basic). Several skills, which transcend particular task domains, were frequently cited in the position announcements and include: computer literacy, professional skills in oral and written communication and the ability to work with others team setting. Work experience in the employer's domain was also desired. These expectancies can be met, at least in part, through an internship, a cooperative position or some other form of practical experience while in school. Industry's demand for these skills and the themes of effective team work, flexibility, interdisciplinary skills, and practical experience are strongly reinforced in the works of Shapiro, et al. (1995) and Shapiro (1995, 1994).

CONCLUSION

The authors hope that they have provided a useful analysis of the placement opportunities available to HF&E professionals seeking positions in industry, government/military, and consulting. It is also hoped that these data will influence the educational opportunities provided to HF&E students.

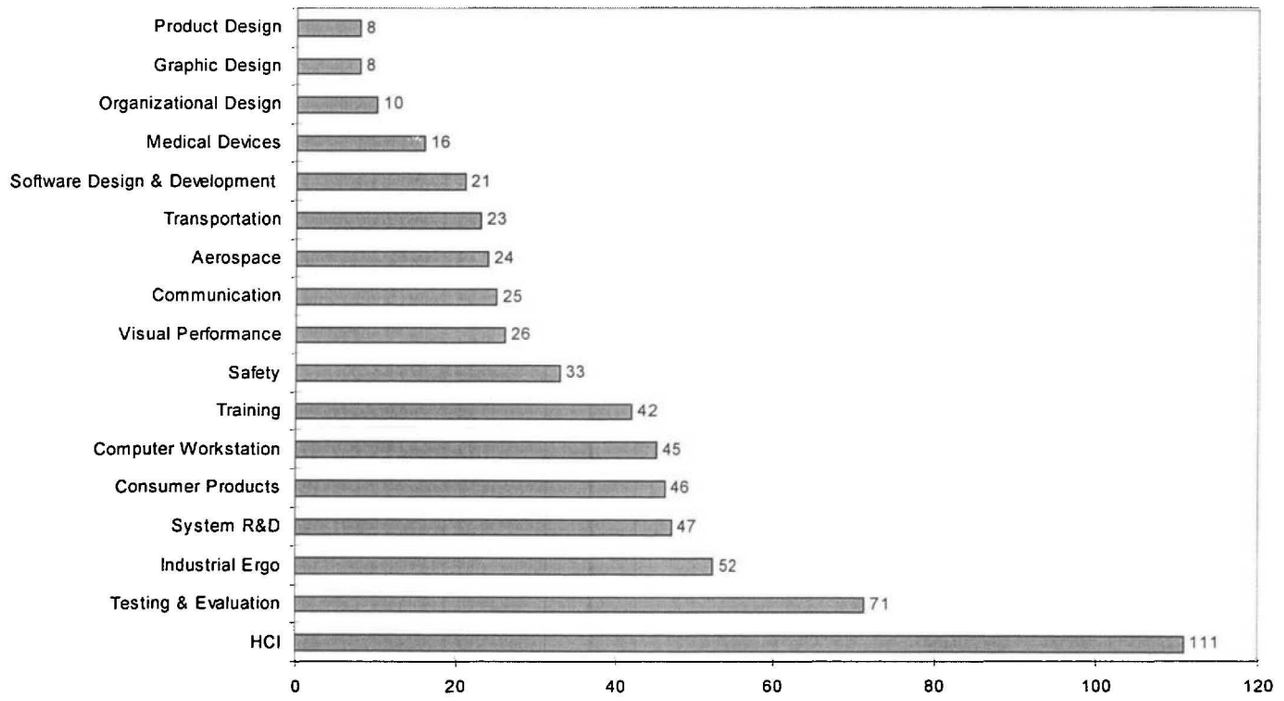

Figure 3. Areas of expertise requested for positions in industry, government/military and consulting (N=161). Note: More than one area of expertise could be specified for each position.

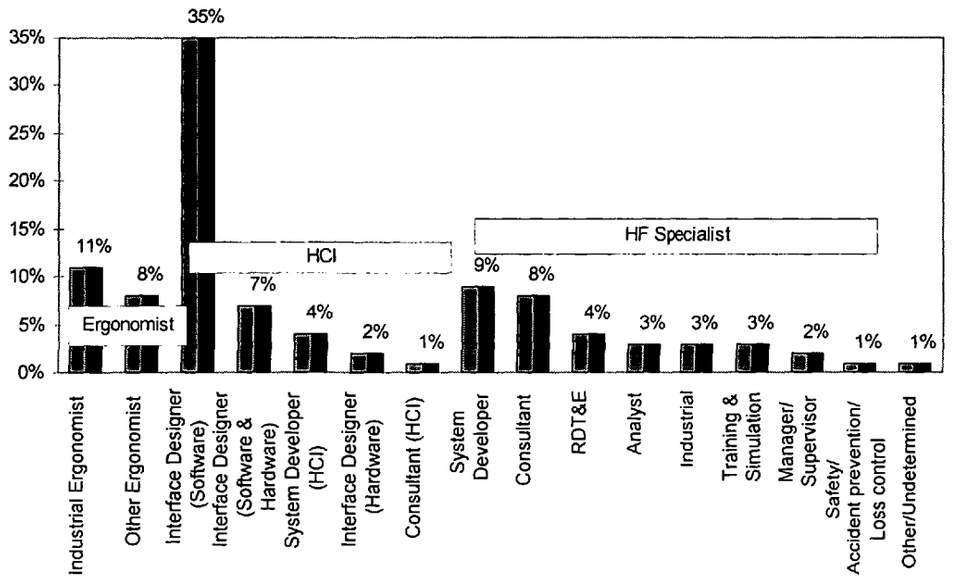

Figure 4. Primary areas of responsibility for positions in industry, governement/military and consulting (N=159).

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