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# HCI Professions: Differences & Definitions

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**Abstract**

In this paper, we present findings from a pilot survey in which we investigated how industry practitioners who create interactive technologies discuss their work and include end users, (e.g. user research methods used). We also explored measures of empathy (a key concept for 'walking in end-user's shoes') among HCI professionals. We found that there were distinct and significant differences among individuals who claimed user-centric job titles (e.g. usability engineer) from those who claimed design-centric job titles (e.g. interaction designer, developer). Differences included how job-title groups considered end-users in their work and their empathetic profiles. We used results from this pilot study to inform a more comprehensive study we are currently undertaking.

**Keywords**

HCI professions; survey; methods; empathy

**ACM Classification Keywords**

K.7.1 [The computing profession]: Occupations

**General Terms**

Documentation

**Introduction**

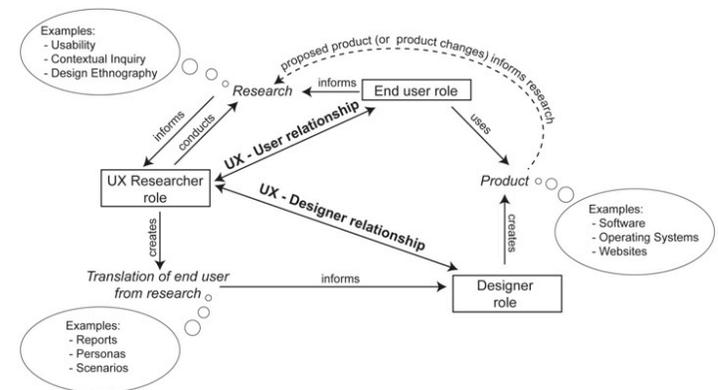
In this paper, we present findings from a pilot study investigating how industry practitioners who create

interactive technologies discuss their work and include end users. This work builds on previous research that has analyzed user-centered design (UCD) practice and research in professional user experience (UX) settings [e.g. 4]. However, in this work, we are less concerned with establishing adherence to UCD principles; instead, we are concerned with identifying practices and differences among professionals that may affect how professionals consider and communicate about end users. For example, we investigated how different professional roles differ in empathy which is often considered important to ‘walk in the users’ shoes’. We also asked about common human-computer interaction (HCI) methods that were used and investigated how job title roles differed in their method usage. In this pilot study, we began with a hypothesis that professionals were often divided into two role types.

We know from our experience, that those who conduct research, i.e. “the user research role” (for example, a usability engineer) are often not those who create products, i.e. “the designer role” (for example interaction designers, developers, writers)<sup>1</sup>. When we conceptualized HCI practice in this way, we pictured a triad of communication among professional roles; i.e., designer – researcher – end user, in which management roles oversaw the triad, see Figure 1. Our triad model emphasized for whom professionals created their work; i.e., UX/HCI roles have different target audiences to whom they communicate. The designer’s audience is the end-user (mediated for example, by an interface, software, or user manual), the researcher’s audience is the designer (mediated for

<sup>1</sup> We are emphasizing roles. We acknowledge that a single person can play multiple roles.

example, by personas or reports). The UX/HCI communication triad, therefore, refocused *end-users as a negotiated message* between research and other members of design teams. As part of this work, we are interested in how that end-user message is communicated and what contributes to effective communication. While the triad model is a simplification, it provided a hypothetical framework to explore and think about how HCI professionals investigate and communicate about end-users.



**Figure 1.** Triad of UX/HCI roles

Specifically, our research questions in this pilot study were (1) how do HCI professionals in industry discuss their job responsibilities? (2) How do professionals in different job titles consider users? (3) What common HCI methods do professionals in industry use, to both (a) investigate and (b) and communicate about end-users? And (4) how do HCI professionals vary in attributes that are related to how they consider users; in this study we explored empathy, which we argue, is a key concept for ‘walking in the user’s shoes’.

### *Informative work*

In this section, we present work that helped frame components of this research in (a) how professionals considered end-users in their work and (b) how professionals varied in empathy.

#### HOW PROFESSIONALS CONSIDERED END USER

In an early exploration of how professionals consider users in their work, Gould and Lewis asked participants at a human factors conference to “*describe approximately three to five major steps you consider good practice for designing, developing and evaluating a new computer system for users*” [2]. Answers were coded for adherence to three user-centered design (UCD) principles: (1) early focus on the user; (2) empirical measurement, e.g. usability; and (3) iteration informed by data from users. Gould and Lewis found that that only 2% of their participants mentioned all three principles and 26% did not mention any of the principles. In our pilot study, we asked our respondents this exact same question in order to investigate how, or if, adherence to the principles had changed, and how did responses differ among job titles.

#### EMPATHY VARIATION

Empathy is defined by Webster’s dictionary as “the projection of one’s own personality into the personality of another in order to understand him better” [3]; it is a key concept to ‘walking in user’s shoes’. Historically in the field of psychology, empathy has been characterized by two broad categories of responses. The first is an intellectual response, i.e., the ability to understand the perspective of another. The second is a visceral response, i.e., the ability to feel the perspective of another at an emotional level [1]. This dual aspect of empathy has led to multidimensional

approaches in attempts to better measure empathetic capacity. For our study, we used the ‘Interpersonal Reactivity Index’ (IRI) to assign an empathy profile to survey respondents. The IRI is a 28-item self-report survey, created by Mark Davis who used a multidimensional approach to explore empathy [1]. The IRI has been validated in other studies and it correlates with other measures for empathy. The IRI measures four separate aspects of empathy from most intellectual to emotional: (1) perspective-taking (PT); (2) fantasy (FS); (3) empathetic concern (EC); and (4) personal distress (PD). The PT measure evaluates the tendency to adopt the psychological viewpoint of another. FS describes propensities to transport oneself imaginatively into the feelings of fictitious characters from books, movies and plays. EC measures levels of sympathy and concern for another in an unfortunate situation. Finally, PD, the most emotional response, appraises feelings of personal anxiety and unease in response to a tense situation involving other people.

### **Methods**

In the next sections we present information about our survey respondents and survey design.

#### *Participants*

Respondents were recruited through ‘snowball’ sampling from multiple sources based in the Seattle, Washington area, including: (a) a link displayed on a recruiting agency’s website and (b) word of mouth in which we asked people we knew professionally to distribute the survey link to potential respondents. Of 213 original responses, 23 were deemed not usable; we evaluated 190 responses. Most respondents were male (65%). Ages ranged from 18 to 60, with about half (51%) reporting ages between 25 and 35.

### Survey design

The survey was split into three parts. In part one, respondents were asked: (1) to report their job experience in years; (2) to identify their job title; (3) to estimate the number of years at job title; (4) an open-ended question about job responsibilities; and (5) were asked the same question from the Gould and Lewis study. In part two respondents were asked about their exposure to user research; i.e. had they ever conducted research or been given research results in their work. The survey then employed a branching strategy based on how the respondent answered this question; respondents with exposure to user research were asked about their familiarity with multiple methods, e.g. personas, focus groups. In part three, respondents were asked their age, gender and if they would be willing to be contacted for further studies. Willing participants were sent the IRI (empathy) test.

### Data analysis and findings

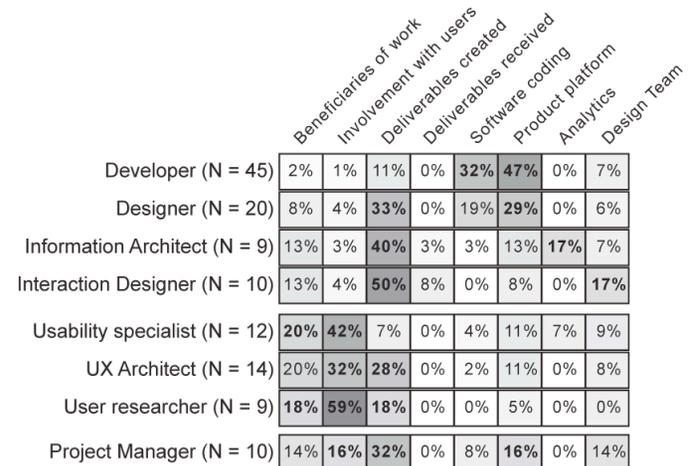
This section is organized by the research questions.

1. *How do HCI professionals who claim different job titles discuss their job responsibilities?* Respondents were asked to “briefly describe their job responsibilities.” We first coded all detailed responses (N = 135) using an in-vivo approach, and then categorized repeated keywords and phrases. We summarized the keywords into eight categories; see Table 1 for the categories and example keywords. We then took the percentage of respondents from each job title category that had included a keyword or phrase in their response; see Figure 2. By grouping job titles according to heat map similarity, we formed three groups: (1) designer-centric, e.g. developer, designer; (2) UX-centric, e.g. usability specialist; and (3)

Management. These groups also supported the hypothetical UX/HCI triad displayed in Figure 1.

**Table 1:** Categorized coded keywords

Category	Example keywords or phrases/ideas
Beneficiaries of work	Users, consumers, stakeholders, clients
User involvement	Usability, user research, eye tracking
Deliverables created	Interface, prototypes, documentation
Deliverables received	Requirements, specifications, uses cases
Software coding	Coding, bugs, testing, function
Platform	Software, web-based, website, mobile, PDA
Data considerations	Analytics, database
Design Team	Team, manage, co-workers



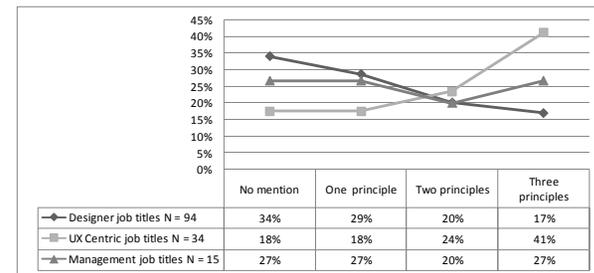
**Figure 2:** Heat map of job description categories x job title (top two categories are bolded). Sample was too small to include writers and program managers.

We also created composite job descriptions based on responses to further explore job title differences:

- Developers (N =45): *"I code and test the functionality of databases and/or other web-based systems."*
- Designers (N = 20): *"I create visual designs and develop interfaces for websites and interactive products."*
- Information Architects (N = 9): *"I contribute to design by developing prototypes, wireframes and site maps that were informed by evaluation of user interfaces through analysis."*
- Interaction Designers (N =10): *"I create and define product specifications and communicate these requirements to other members of my team."*
- Usability Specialists (N = 12) *"I ensure interface usability through direct testing with users."*
- UX Architects (N = 14): *"I conduct UX research and utilize the results to inform the navigation and design of user interfaces."*
- User Researchers (N = 9): *"I conduct UX research through a variety of user-centered methods, then analyze and communicate the results to other team members."*
- Project Managers (N = 10): *"I create deliverables (specifications and requirements) that guide and manage design."*

2. How do professionals in different job titles consider users? We coded 158 detailed responses to the Gould and Lewis query. Inter-rater reliability was calculated through analyzing pair-wise agreement for each Gould and Lewis principle using Cohen's Kappa. Reliability was moderate or better:

- For the 'early user focus' =  $\kappa = .66, p < .001$ , indicating a **substantial agreement**;
- For the 'empirical measurement' =  $\kappa = .64, p < .001$ , also in the **substantial agreement** range;
- For the 'iteration' =  $\kappa = .42, p < .001$ , which is considered a **moderate agreement level** [5]



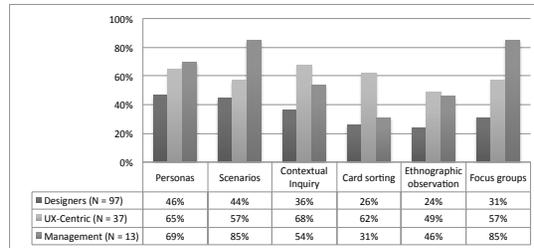
**Figure 3:** Differences in Gould and Lewis query x job type

We then investigated relationships among the job title groups we had created (designer, UX, management) and adherence to Gould and Lewis's three UCD principles. While respondents reporting a UX Centric job were very likely to mention at least two principles (65%) only 37% of those with designer-centric job titles mentioned at least two, see Figure 3. The differences were significant,  $F_{(2,140)} = 4.67, p < .05, f = .33$ , indicating that job title-type was significantly associated with mention of UCD principles.

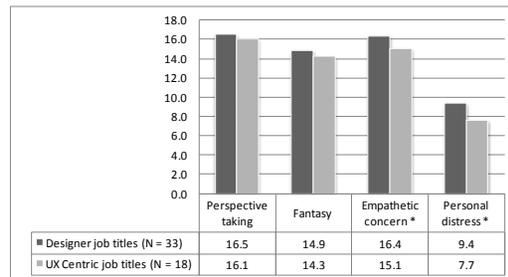
### 3. What HCI methods do professionals use, to both (a) investigate and (b) communicate about end-users?

Respondents who had conducted or been give user research conducted by someone else ( $N = 157, 83%$ ) were asked about which methods they had experienced. A sample of the most common methods we asked about by job-title type, displayed in Figure 4.

The differences among job title groups were significant in every category of method.



**Figure 4:** HCI method exposure by job-title type



**Figure 5:** Differences in empathetic profile x job type

4. *How do HCI professionals vary in attributes that are related to how they consider users: empathy?* Since the IRI was intended to measure four underlying empathetic dimensions (PT, FS, EC and PD), we first investigated correlations among the seven items in each dimension. We deleted two of the PD questions because answers were not significantly correlated. Respondent and study participants with designer-centric job titles ( $N = 33$ ) had higher overall scores in all empathy dimensions compared to those with UX Centric job titles ( $N = 18$ ). Differences were significant at the .10 level for both EC,  $t(48) = 1.95, p = .057$ ,

and PD,  $t(48) = 1.71, p = .093$ . Note, these are two most emotional dimensions, see Figure 5.

## Conclusion and future work

Pilot study findings supported the hypothetical communication triad model; i.e. the professionals who create products for end-users define their work differently than the professionals who conduct user research (and from management). They used different methods, had different empathy profiles, and had a much different understanding about UCD principles. We are currently expanding this work with a larger and more diverse sample in which, we started with a similar survey as a screener. The expanded study will explore regional differences among HCI professionals, temperament differences among job titles, and investigate how accessibility issues are considered. Additionally, we plan on analyzing how idiosyncratic professional practices are to a particular industry, company, and region and how practices are changing over time.

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