BACKGROUND

One element of a legally defensible job analysis is the inclusion of a thorough task analysis, or the examination of discrete tasks required of the job (Brown, 1996). However, in today's knowledge economy, how a job analyst gains access to tasks carried out by knowledge workers (e.g., accountants, computer programmers, etc.) is obfuscated by the constraint that an individual interacting with a computer presents. In traditional, manual labor jobs, acquiring tasks conducted allowed for recording of observable, discrete units of work such as shopping and lifting. The interface with a worker and his/her computer prohibits a job analyst to get a clear picture of the work for at least three reasons: 1) the speed of the work, 2) integrated systems, 3) undefined analytical processes. Thus, the goal of the present effort is to evaluate how the use of eye-tracking and screen capture technologies impact observation and analysis of the cognitive tasks conducted by knowledge workers.

RESEARCH QUESTION

How can eye-tracking and screen capture (i.e. oculometrics) technologies impact observation and analysis of the cognitive tasks conducted by knowledge workers?

METHODOLOGY

Phase 1: Survey

- 2 parts:
  - Worker preferences, opinions, and backgrounds
  - Worker perceptions of information and systems required to complete work
- Purposes:
  - Capture individual differences between worker experience and perceptions
  - Capture individual perceptions of work processes required to complete the work

Phase 2: Scenario Eye-Tracking

- Static images of company systems were organized into a “logical” work process (or scenario)
- Purposes:
  - Sample a wide array of potential work processes
  - Evaluate visual attention required to complete the tasks
  - Identify specific pieces of information required to solve problems
  - Control environment removal typical work and technological distractions

Phase 3: VPN Eye-Tracking

- Two portions: (1) prompted, (2) unprompted
- Purposes:
  - Capture a range of work processes across a range of worker experience levels
  - Capture individual differences in knowledge processes and task completion in a live, uncontrolled environment

Phase 4: Eye-Tracking Interview

- Semi-structured, 1 on 1 interviews conducted while reviewing the VPN eye-tracking recording
- Purposes:
  - Acquire verbal confirmation of the conclusions drawn from eye-tracking and screen capture results
  - Increase researcher understanding of work being completed

DATA AND RESULTS

Chronological Order: Participants Visited Each Task System in Scenario 1

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Phase 3: VPN Eye-Tracking

- Please refer to the computer screen next to this poster for visualization of the data collected.

Phase 4: Eye-Tracking Interview

CONCLUSIONS

ICUP Model Significance:
- Information Interface
- Attention
- Memory
- Environment
- Communication

Based on our findings, eye-tracking and screen capture technologies can be utilized in this four-phase methodology to accurately extract the knowledge, skills, and abilities required to complete knowledge work. This methodology also goes further to identify specific information needed to complete the work.

RECOMMENDATIONS

- Modify the methodology to the cognitive task being performed
- Begin each eye-tracking cognitive task analysis with a traditional job analytic survey
- Utilize eye-tracking technologies in two stages to capture both controlled and uncontrolled responses

KEY REFERENCES


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