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 obtained by the constraint that an individual interacting with a computer process. In traditional, manual labor jobs, assessing tasks (history) 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, and 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

- Two portions: (1) prompted, (2) unprompted
  - Participants:
    - Worker preferences, options, 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 knowledge 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 removed typical work and technological distractions

Phase 3: VPN Eye-Tracking

- Two portions: (1) prompted, (2) unprompted
  - Participants:
    - 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 interview conducted while reviewing the VPN eye-tracking recording
  - Purposes:
    - Acquire verbal confirmation of the conclusions drawn from eye-tracking and screen capture recordings
    - Increase researcher understanding of work being completed

DATA AND RESULTS

Phase 1: Survey

“While working in shipment, if I need to go to waybill to make a correction, once the comment box pops open I cannot go back to shipment to get info I may need for the comment. I have to write stuff down before I go there or go out and start over to find that info if I forget.” - Study Participant

Phase 2: Scenario Eye-Tracking

Phase 3: VPN Eye-Tracking

Phase 4: Eye-Tracking Interview

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

CONCLUSIONS

ICIP Model Significance:

- Information Interface
- Information Handling
- Mental Plan and Schedule
- Memory
- Mental Execution
- Monitoring
- 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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