Designing PhotoFile: A Tool For Documenting Observations

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INTRODUCTION

PhotoFile allows you to take digital photographs and immediately annotate them. The system is designed for engineers, designers and ethnographers who conduct observational research in the field.

Designers collect data about the system, environment, and users. Tools to collect data include cameras, notes, measuring devices, and recording devices.

MAJOR OBSERVATIONS

- The purpose of conducting research varies from researcher to researcher. Examples of things observed in field work: operations, procedures, tasks, users, etc.

- Researchers use many tools and artifacts while conducting field work. E.g. paper, pen, documents, cameras, recording devices, notes, lists, documents, and schedules. The contents have to be organized and the tools have to be physically managed.

- Researchers use the tools listed above to conduct the following tasks: describe observations, note time, measure objects, sketch, record audio/video, and follow up with any post mortem issues.

- Most people feel that photographs are a valuable contribution to field work.

- The people who don't take pictures on the field do so because they feel it would jeopardize the 'naturalness' of the environment.

- Most people indicated that they multitask while conducting field work.

- People hold the PDA in one hand, with the stylus in another (this is important with regards to what additional tasks they can physically perform).

- People equally prefer categorizing photos chronologically and/or categorically (and both add great value).

- Using the listed tools, most people still forget to collect some sort of data.

DESIGN REQUIREMENTS

- The system can't assume too much about the researcher, the environment in which the researcher is using the system. System functionality should focus on commonly used tasks and tools that are not specific to an environment or a situation.

- The system should allow users to: perform more than one annotation on a photo; switch between photos, and allow interruptions in the workflow.

- Since both hands are occupied, the photo taking mechanism should not require the full hand. E.g. Should not expect users to stop writing to look through a lens and focus.

- Researchers use observations to compile results of system analysis

STAKEHOLDERS

The primary stakeholders are engineers, designers, and ethnographers. Others who may be affected by the system include clients, supervisors, as well as users of the system being analyzed. Nine participants responded to a fifteen minute long, open and closed ended questionnaire.

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EVALUATION METHOD

The PhotoFile addresses researchers specialized needs for documenting observations. These needs can be summarized by 3 usability goals:

- Effectiveness
- Efficiency
- Ubiquity

Next iteration of prototype:

- Redesign in order to account for issues discovered during usability testing: the need for clear icons, consistent labels, clear functionality, error prevention, useful tools, and flexible functionality.

- Formative evaluation of design in order to verify overall effectiveness, efficiency and ubiquity

EVALUATION RESULTS

- On average, 17% (2/12) of the icons and labels were not clear to users.
- On average, 17% (2/12) of the labels had surprising or undesirable outcomes when selected.
- Icons loose some meaning due to proximity to other icons with unrelated functionality.
- Valuable suggestions: e.g. Hyperlink annotation tool, viewing options such as zoom and pan.
- Inconsistent labels caused confusion.
- Inability to "undo" actions, "delete" annotations, confirm save of layer prior to selecting new photo.
- Varied preferences for mechanisms to focus camera lens and 'snap' a photo.
- Entire system generally well accepted. All user speculated that the system can be an efficient organization tool for documenting observations.

Heuristics to Re-examine:

- Visibility & Recognition
- Flexibility & Efficiency
- Consistency & Standards
- Error Prevention & Recovery

RESULTS

CONCEPTUAL DESIGN & FUNCTIONALITY

Annotation tools should satisfy general, common needs. As well, templates may not be an effective option since there is so much variability among the users.

The following annotation tools replace the physical tools: text entry, measurement, audio recordings, timestamp, and sketch. Other tools may also be necessary and will be determined through usability testing.

Ensure that each Annotation tool adequately replaces the physical tool. E.g. the text entry tool allows users to describe observations.

Provide functionality to make annotations directly on photographs.

For example, users won't need to lift the camera lens to eye level to take a photo. Users can focus lens on an area, or 'snap' a photo, using one of several mechanisms (in addition to a button).

Multiple annotations can be made on one photograph. Provide two toggleable modes: ‘View’ mode and ‘Album’ mode. Allow users to save and return to (multiple) annotation layers.

The mechanism can be an icon on the monitor, a physical button on the PDA, aligned with the way the device is held, and/or a button on the stylus. Clicking a button on the stylus makes use of the mechanism of clicking a pen to expose the ballpoint.

Photographs are automatically time-stamped. ‘Album’ mode will be a folder structure; both photos and folders can be named.

Use icons for annotation tools (as opposed to hidden menus). Icons must accurately represent corresponding functionality.

EVALUATION METHOD

Usability testing involved 9 potential users, and three stages:

1. Users were asked to complete tasks with think-aloud techniques. First, they traversed through the annotation icons, then they traversed through the Album folders.

2. Using the physical prototype, users were asked to try various mechanisms to simulate rotating the lens to a suitable position, and ‘snapping’ a photo.

3. Users were asked open-ended questions regarding existing as well as additional functionality, as well as general comments.

PROTOTYPES

1. Early design established with low fidelity paper prototype.

2. Horizontal, interactive prototype with links and animation created in PowerPoint. Allows users to take several photographs in a scenario.

3. Virtual prototype utilizes shape and size of system.