More Information May Reduce Errors for Novice Users

Usability Testing and Redesign of the Square Register App

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1

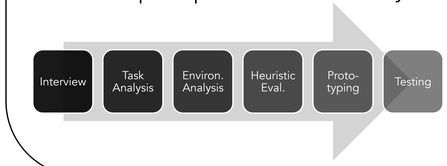
Background

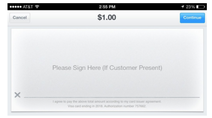
- Mobile computing allows for **on-the-go point-of-sale** (conventions, festivals, etc.)
- **Square, Inc.** was one of the earliest to adopt this approach, and among the most successful
  - Starbucks investment in 2011
- Do novice users understand how the technology works?
- Do they understand what the transaction requires?

2

Usability Evaluation

- Research team performed **usability evaluations**: user interviews, environmental analysis, task analysis, and heuristic evaluation.
- User interviews: Structured with some open questions. "How do you prefer to pay?" "What do you think this does?" "What do you need to do?"
- **Novice users did not understand** signing with the finger, and had doubts about the security of the system
- Task analysis: Decomposed task and classified errors using an HTA
- Uncovered potential issues relevant to **inconsistent mapping** of controls
- Signature screen **did not adequately instruct** users of required action; **misleading feedback** at receipt selection
- Heuristic evaluation: Revealed that many elements of the interface do not allow for **error recovery**





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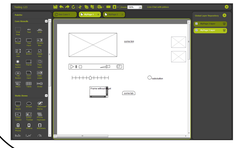
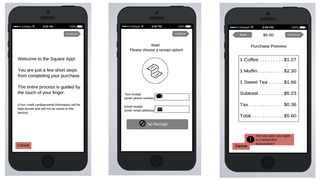
Redesign

- Research team attempted to address usability issues identified above in a **redesigned prototype**
- Two tools were chosen: **Pidoco** (wireframing) and **InVision** (hot spots for interaction)
- Based on interviews, a "**welcome screen**" was proposed to give users a concept of the interface
- Additionally, an **itemized receipt** screen
- Based on task analysis, additional instruction was provided on specific screens, feedback was changed, and controls were mapped consistently
- Based on heuristic evaluation, more opportunities were provided for error recovery
- **Two redesigns** were used: one with and without the welcome screen
- Use was tested by volunteers with an imaginary, typical scenario





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Testing

- **18 student volunteers** (72% female, mean age of 25.3) participated
- **Time to completion, errors, and subjective usability ratings** were taken as measures
- Results were divided among **novice and experienced users** of the app
- Novice users performed better and preferred the original design (see discussion)
- Between redesigns performed better and novice users **preferred the welcome screen**

Discussion

- Prototyping flaws limit results: InVision errors outnumbered other errors
- A true apples to apples comparison was not made
- Learning experience for the research team: operationalize performance in terms of redesign improvements
- Some support for the welcome screen reducing errors