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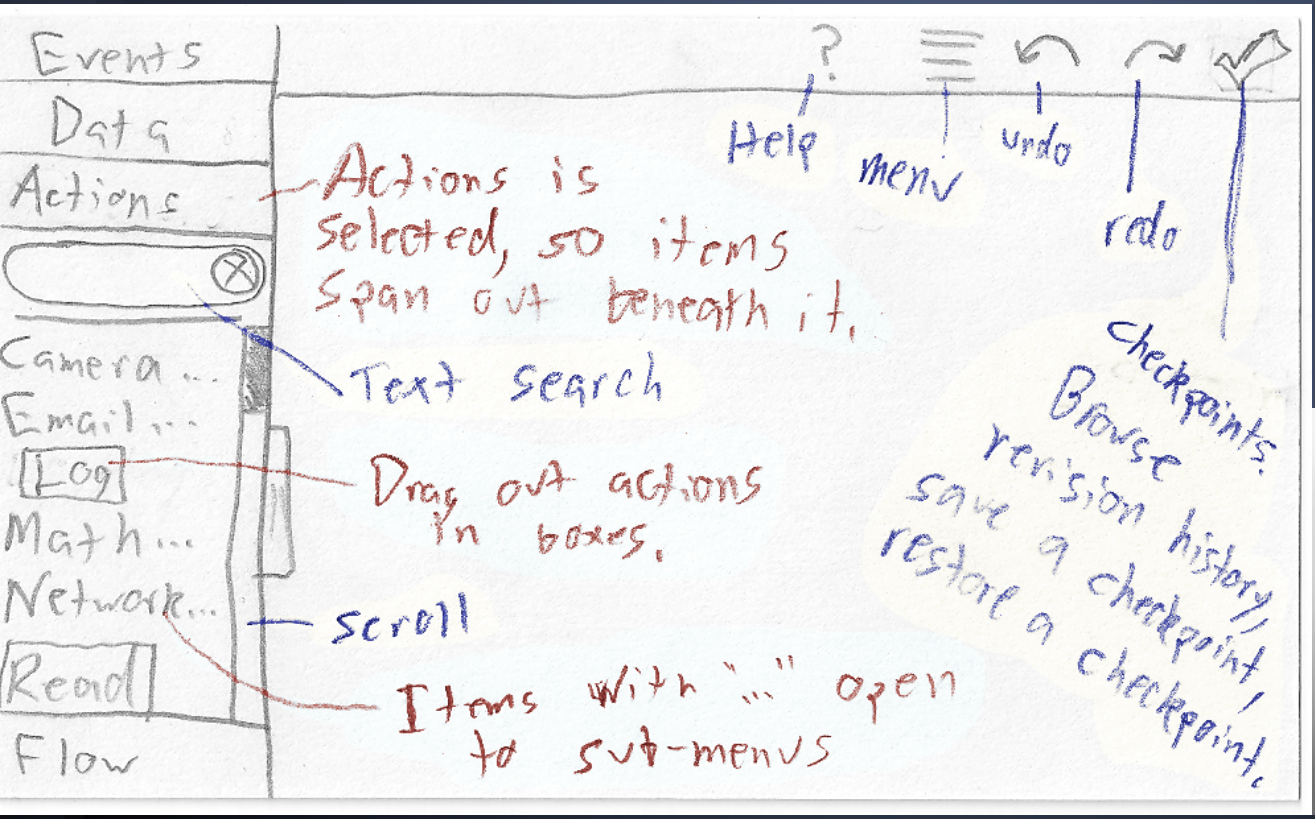
Problem overview

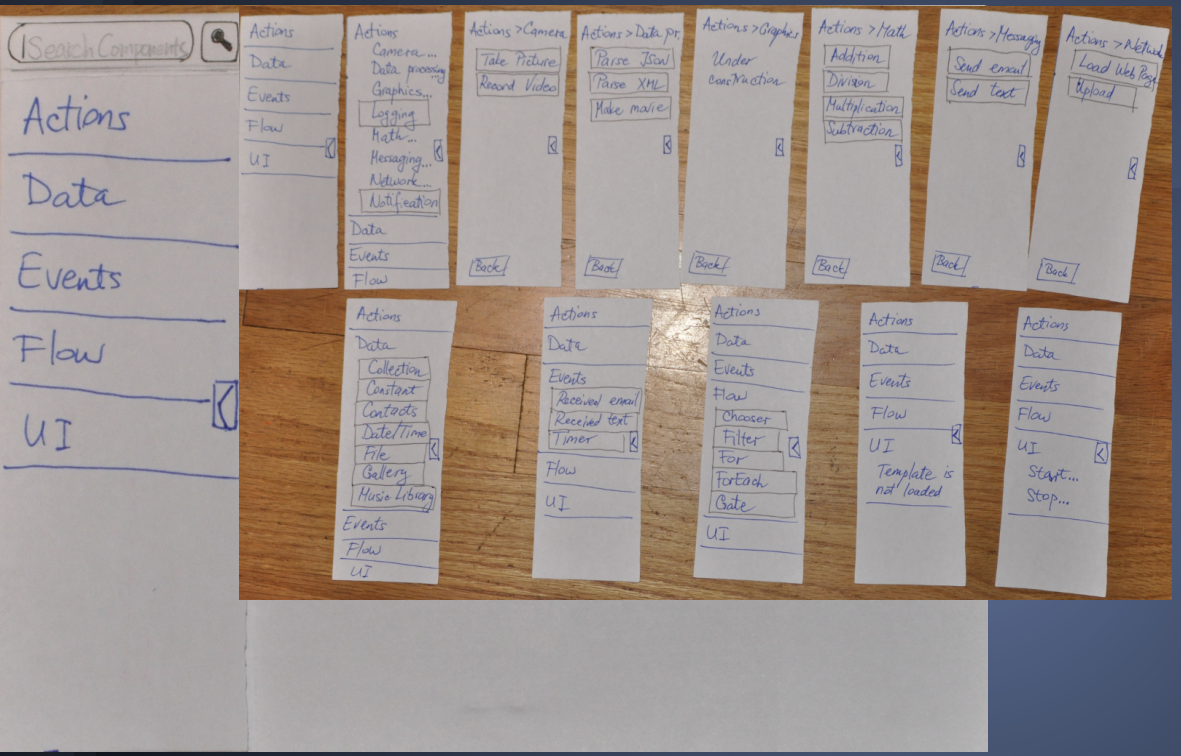
- No good way to program from a tablet
- Requires a keyboard
- Lots of text on a small screen

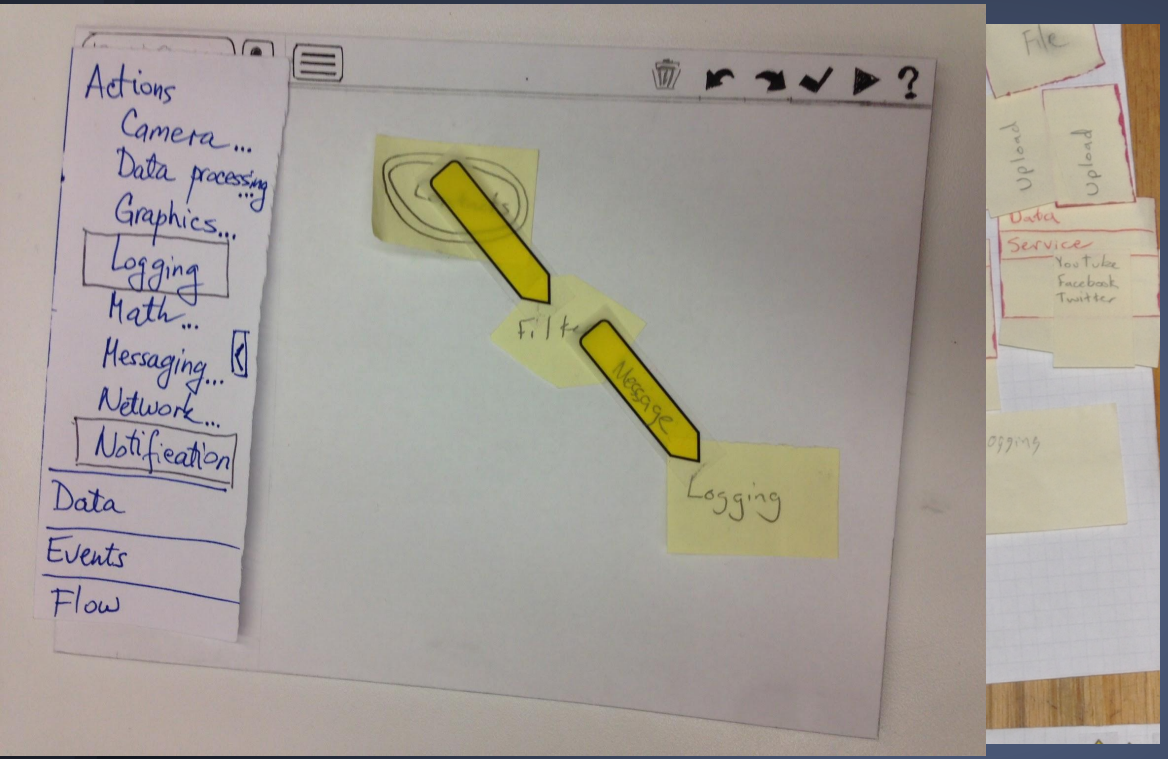
Solution overview

- Focus on small applications
- Few events and actions
- Automating common tasks
- Use touch & common tablet gestures
- Minimize typing

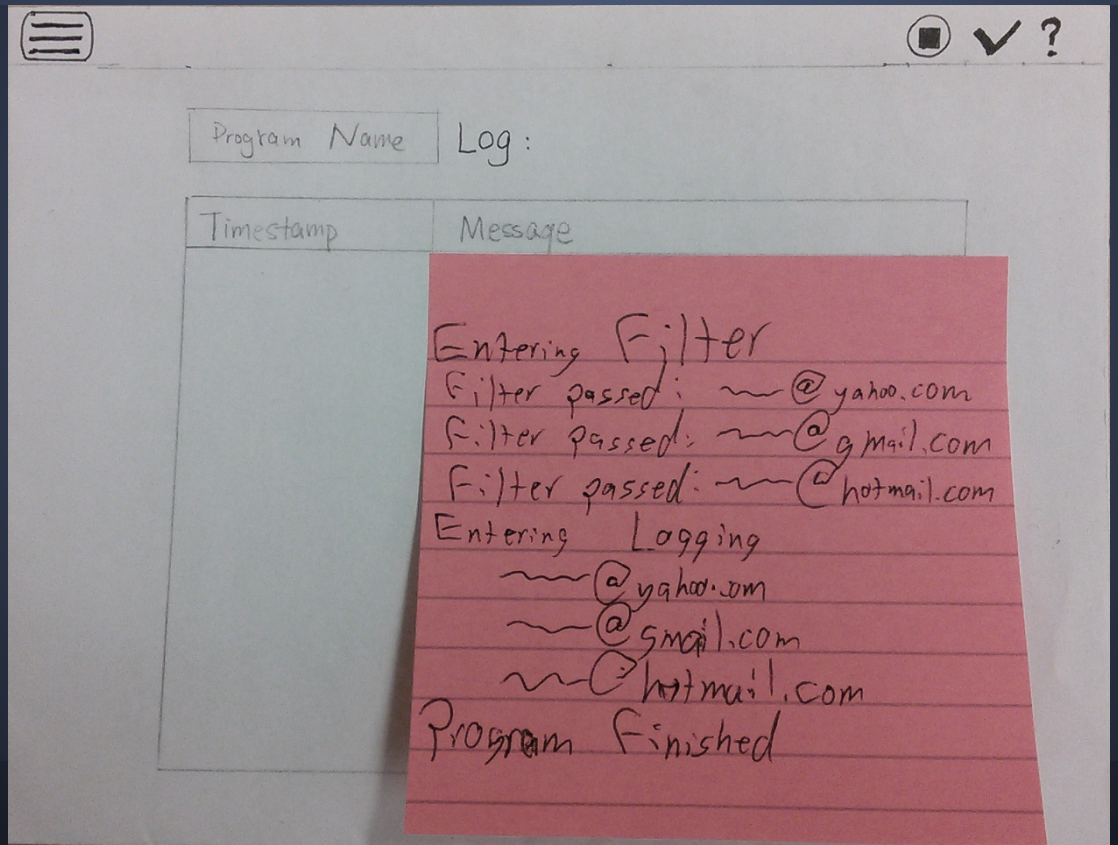
Selected Design to Paper Prototype




Search Components
Actions
Data
Events
Flow
UI
Actions
Data
Events
Flow
UI
Actions
Camera...
Data processing
Graphics...
Logging
Math...
Messaging...
Network...
Notification
Data
Events
Flow
Actions > Camera
Take Picture
Record Video
Back
Actions > Data pr
Parse JSON
Parse XML
Make movie
Back
Actions > Graphics
Under construction
Back
Actions > Math
Addition
Division
Multiplication
Subtraction
Back
Actions > Messagg
Send email
Send text
Back
Actions > Networ
Load Web Page
Upload
Back
Actions
Data
Collection
Constant
Contacts
Date/Time
File
Gallery
Music Library
Events
Flow
UI
Actions
Data
Events
Received email
Received text
Timer
Flow
UI
Actions
Data
Events
Flow
Chooser
Filter
For
Foreach
Gate
UI
Actions
Data
Events
Flow
UI
Template is not loaded
Actions
Data
Events
Flow
UI
Start...
Stop...


Actions
Camera...
Data processing...
Graphics...
Logging
Math...
Messaging...
Network...
Notification
Data
Events
Flow
Filter
Message
Logging
File
Upload
Upload
Service
YouTube
Facebook
Twitter

Execution View

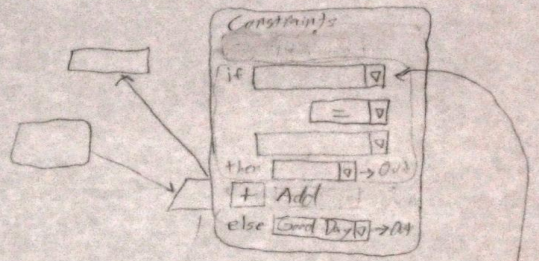


Actions
Data
Events
Flow
UI

Search
Actions
Data
Events

This is the Components Menu.

This is the Quick Bar. The options up here allow you to create and load projects, modify your programs

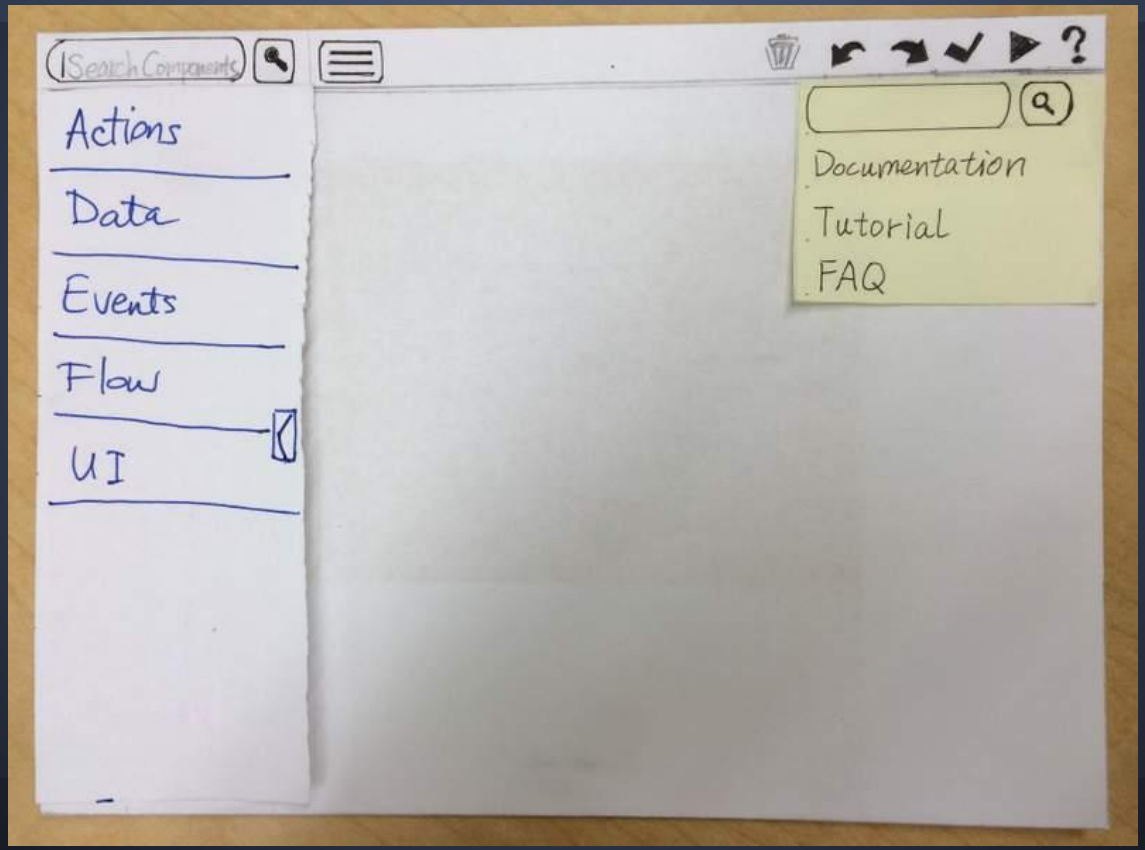


Night is from 6pm to 6am, so you'll need two constraints. They'll both compare the current hour to a constant.

Tap the first dropdown to continue.

Back

Help System


Search Components
Actions
Data
Events
Flow
UI
Documentation
Tutorial
FAQ

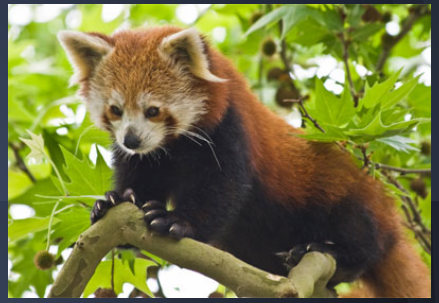
Testing methodology

- Initial testing between ourselves
- 4 participants for user testing
  - software engineers
  - good programming skills
  - expert tablet or smartphone users
  - minimal or no tablet programming experience
  - minimal or no data-flow programming
- Environment
  - office / conference room

Tasks

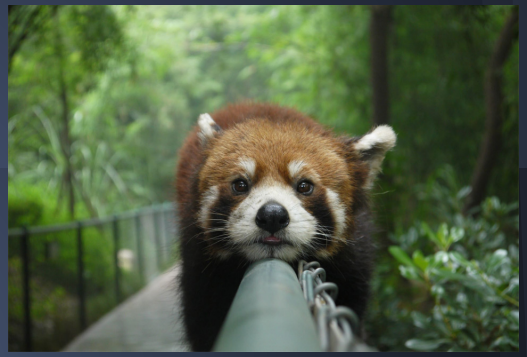
- Notify a user when a particular item becomes available for online purchase
- Send individual emails to a subset of your contact list
- Take photos periodically and produce a timelapse video

Tasks



- Log a subset of the contacts list
- Send a group email to the subset of the contacts list
- Send individual emails to a subset of your contact list

Testing methodology



- Procedure
  - Facilitator gives the introduction
  - Task description is given on a card
  - A tutorial explains how to use the system
  - User performs the tasks
  - 5-15 minute semi-structured interview at the end
- Test measures
  - Subjective: identify trouble spots
  - Objective: measure time / number Help invocations

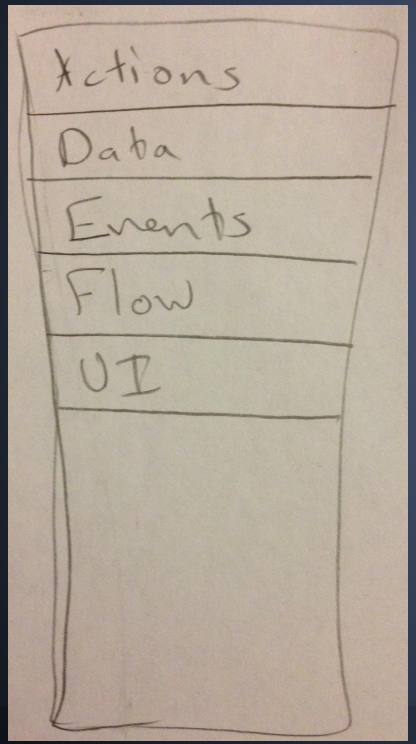
Test results

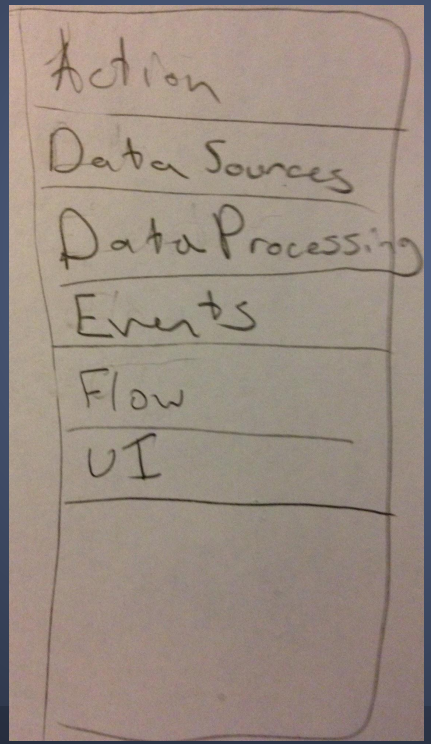
- Initial tasks were too hard
- All participants completed full tutorial (12m)
- Objective measures:
  - ~15 minutes per task
  - ~1 usage of the help system per task
- Successes:
  - Tutorial
  - The log
  - Help system

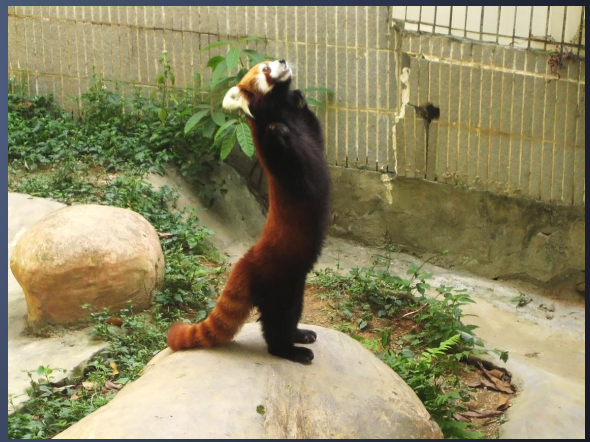
Test results, negatives

- Some main issues:
  - Confusion about data-flow programming model
  - Trouble finding components in the menu
  - Constraint editor was a pain point
  - Parameter selection was confusing
  - Trouble removing components and connections
  - Typing in constants wasn’t intuitive

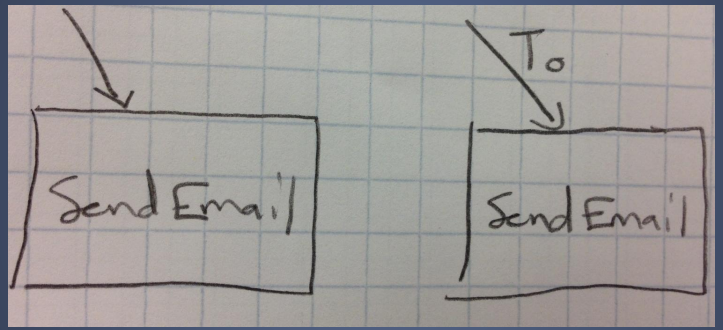
Interface Revisions

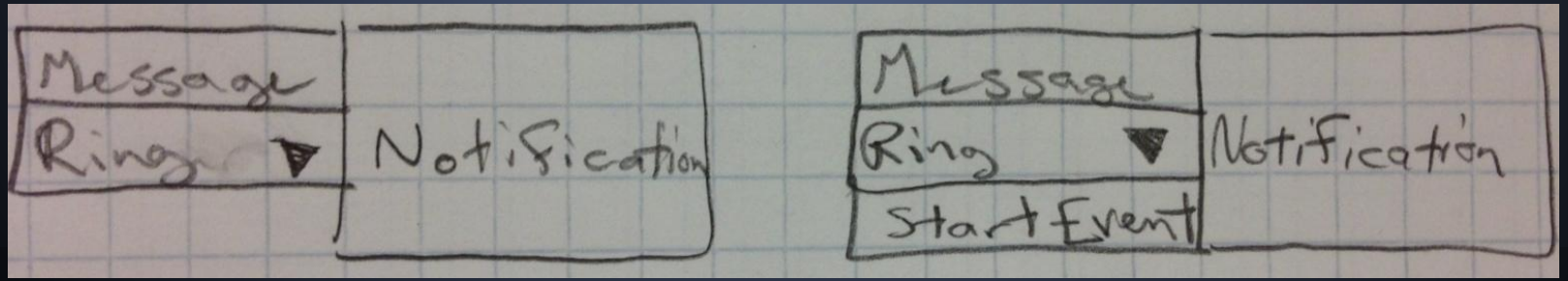






Interface Revisions





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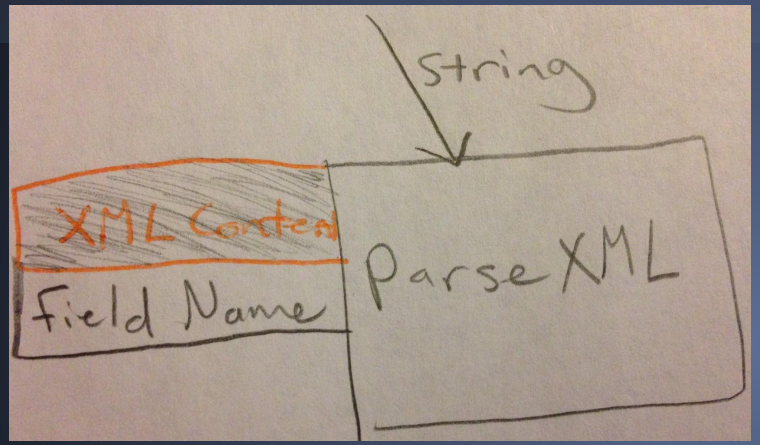

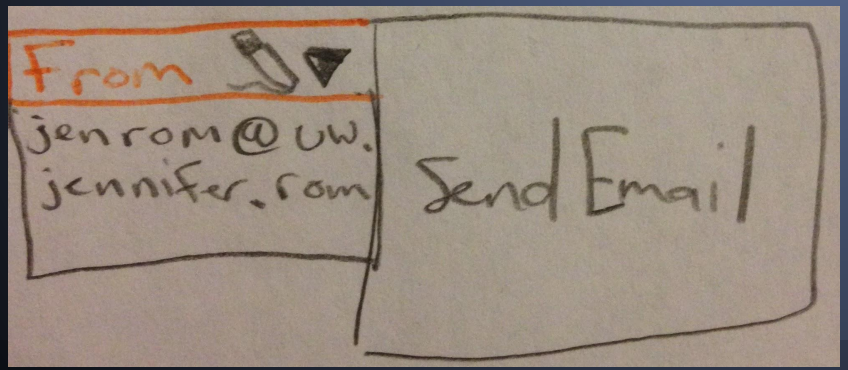

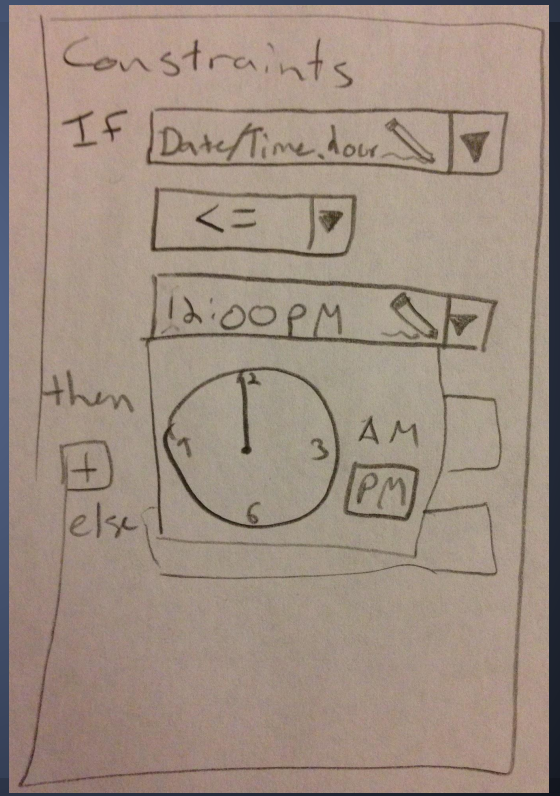

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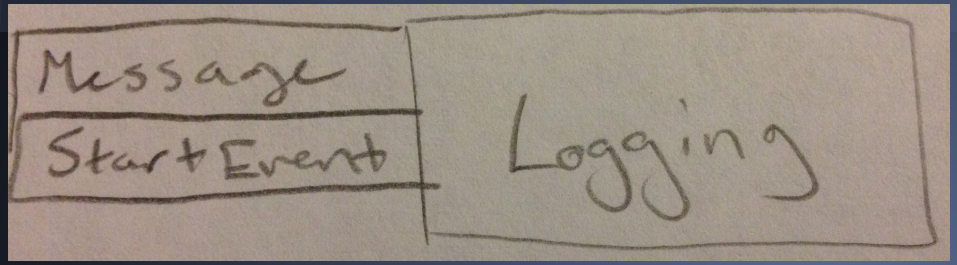
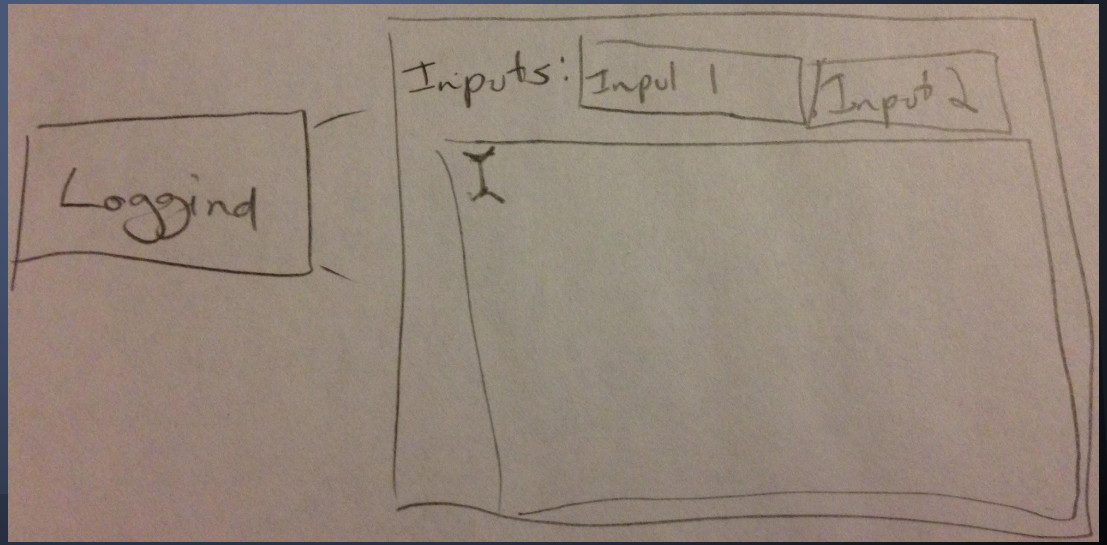
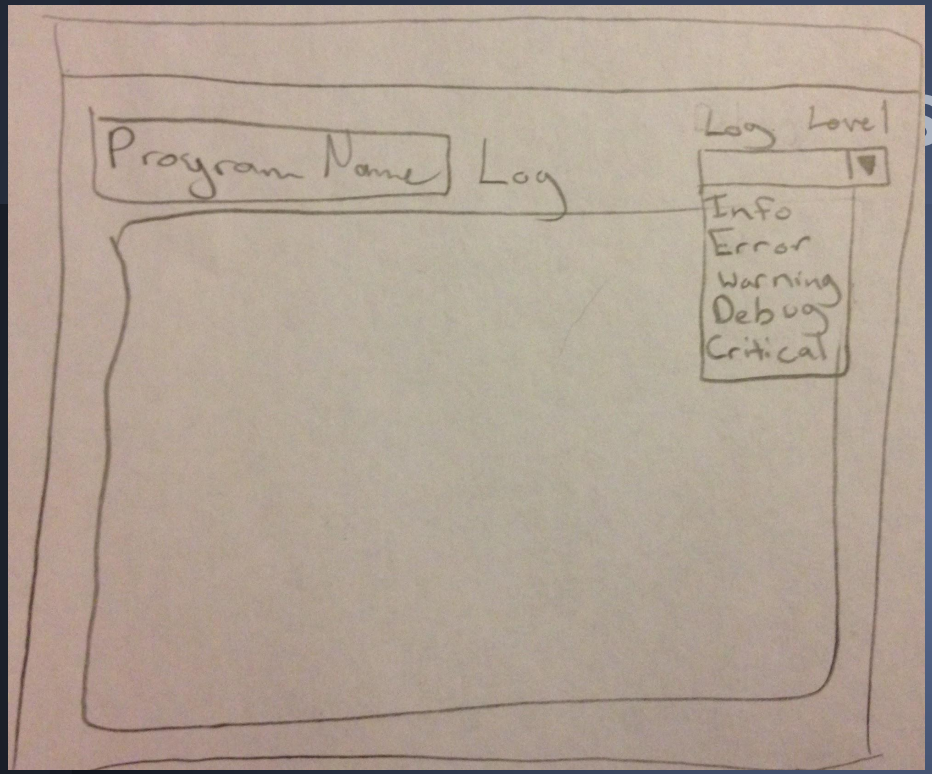





Program Name
Log
Log Level
Info
Error
Warning
Debug
Critical

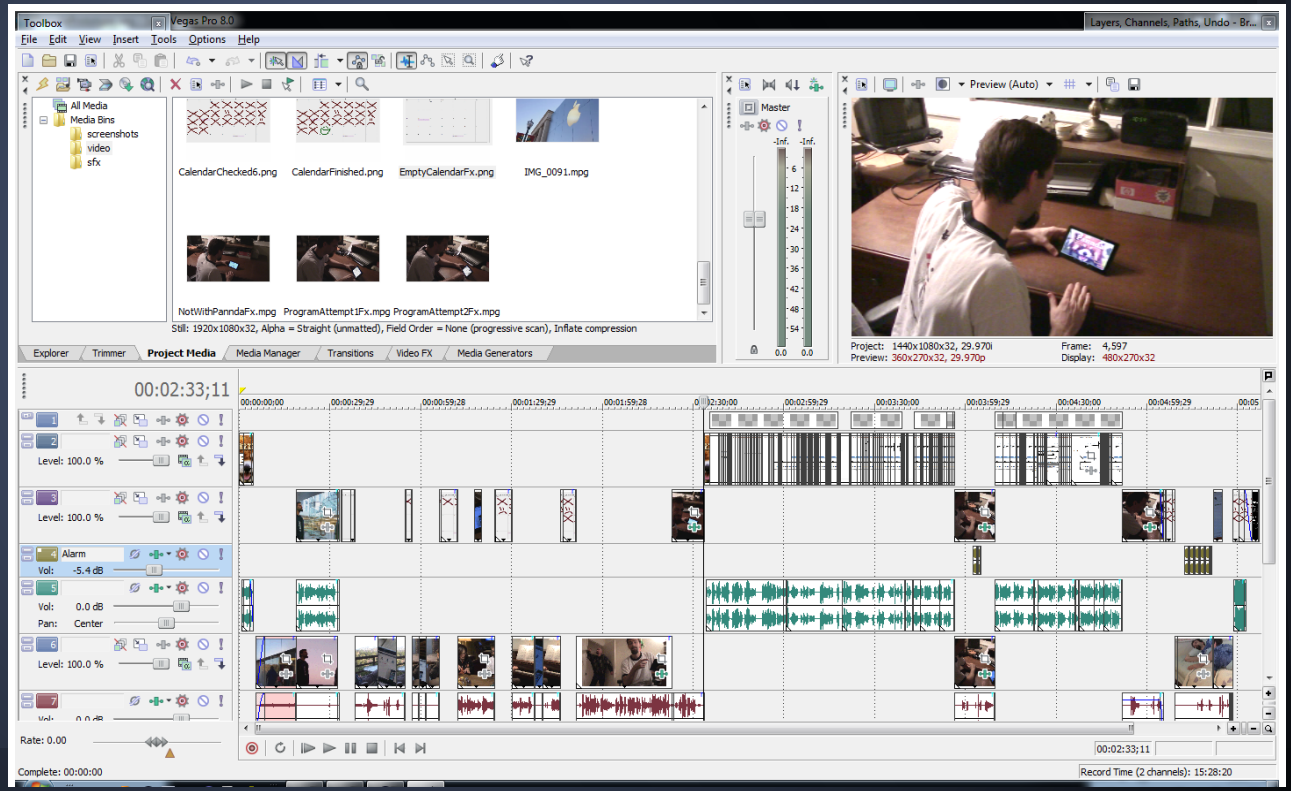
Video Prototype

Making of the Video Prototype

- Balsamiq Mockups: 231 screenshots
- Photoshop
- Bash scripts
- Cinescore
- Audacity
- Cooperative family members

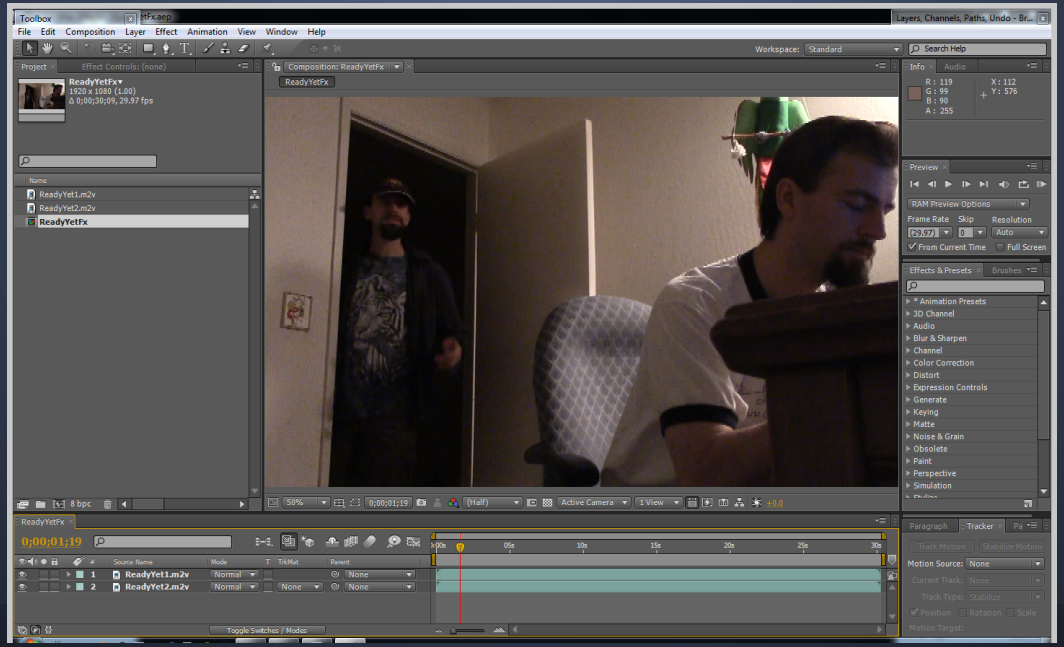
Making of the Video Prototype

Sony Vegas



Making of the Video Prototype

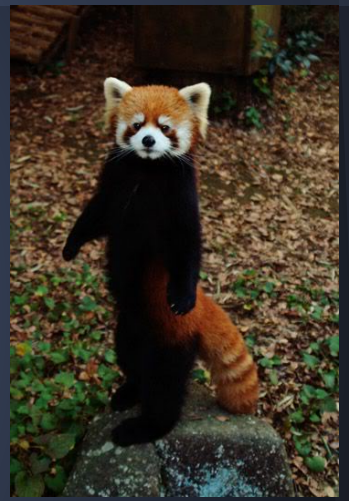
Adobe After Effects



Making of the Video Prototype

Blue screen at dusk

Conclusion, Lessons Learned

- Data flow? What's that?
- Visual programming is hard

- Zen mind, Designer's mind
- Do not become attached
- RTFM
- Users will break your interface
- An interactive tablet app...on paper?