Dynamic Graphics Project
EST. 1967
in future we will carry not just one but many smart devices
How can we enable users to dynamically form ad hoc arrangements of devices to suit their current needs?
Buy music
Download music from iTunes on any device.

iCloud stores it
Your music is stored in iCloud.

And pushes it to your devices
Your music automatically appears on your iPad, iPhone, iPod touch, Mac, and PC.
Welcome to SkyDrive

Your most important files are with you wherever you go, on any device.
Towards Symphonies of Devices
What arrangements of devices provide useful, usable, desirable experiences?
How can content producers target unknown device combinations?
Project Components

- Ethnographic research
- Interaction design
- Development tools
Project Components

- Ethnographic research
- Interaction design
- Development tools
A field study of multi-device workflows in distributed workspaces

Participants’ Industries

- Business / Marketing Consulting (32%)
- Creative (27%)
- Information Technology (14%)
- Health (14%)
- Engineering (9%)
## 1. Artifact analysis matrix

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Stakeholder (who)</th>
<th>Tasks (what)</th>
<th>Applications (what)</th>
<th>Info transfer out (how)</th>
<th>Info transfer in (how)</th>
<th>Input</th>
<th>Local Info (what + where)</th>
<th>External Info (what + where)</th>
<th>Context of use (where)</th>
<th>Why/Notes</th>
<th>work provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop (Dell Inspiron, Windows), Work provided</td>
<td>User, Collaborator, Client</td>
<td>Preparing reports, research, data processing, browsing the web, running models</td>
<td>Microsoft Office, Chrome Browser, PDF reader, Engineering modeling software</td>
<td>To tablet/phone: Dropbox; email to others</td>
<td>From tablet/phone: Dropbox; USB from others</td>
<td>Mouse, Keyboard</td>
<td>(below)</td>
<td>Current docs temporarily on Dropbox for transfer only (doesn’t leave on Dropbox permanently for security)</td>
<td>Work (always), Home (sometimes)</td>
<td>Primary device for work</td>
<td>Content production; production is on the laptop and reading is on the tablet (not much back and forth). The laptop is easier to edit with. Editing applications are better (tablet is too slow). Some docs benefit from more screen space.</td>
</tr>
<tr>
<td>HP Tablet (Laptop, personal)</td>
<td>User, Family</td>
<td>Creating graphics; occasional</td>
<td>Photoshop, VLC, Dropbox</td>
<td>Dropbox, USB</td>
<td>Mouse, Keyboard</td>
<td>Image files</td>
<td>Documents, shared files and others on Dropbox and Box.net</td>
<td>Home</td>
<td>Personal design projects</td>
<td>Stylus input for generating drawings; infrequent usage</td>
<td>no</td>
</tr>
</tbody>
</table>

**Task details**

<table>
<thead>
<tr>
<th>User</th>
<th>Preparing presentations</th>
<th>Microsoft PPT</th>
<th>To tablet/phone: Dropbox</th>
<th>From tablet/phone: Dropbox; email from others</th>
<th>Side presentations</th>
<th>Docs to be transferred (Dropbox)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Research</td>
<td>Chrome Browser, PDF reader</td>
<td>Pocket, Dropbox</td>
<td>Dropbox</td>
<td>Documents</td>
<td>Docs to be transferred (Dropbox)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

- Laptop: Dell Inspiron, Windows
- HP Tablet: Laptop, personal
- Work provided: yes
- Why/Notes: Content production; production is on the laptop and reading is on the tablet (not much back and forth). The laptop is easier to edit with. Editing applications are better (tablet is too slow). Some docs benefit from more screen space.
Findings

Serial and Parallel Patterns

Specialization of Devices & Tools

Data Fragmentation
Project Components

- Ethnographic research
- Interaction design
- Development tools
Conductor: Enabling and understanding cross-device interaction
Vision
The Future
Conductor
Conductor Application

- City Hall
- Royal Ontario Museum
- CN Tower
- Distillery District
- Bahen Centre for Information Technology
- Casaloma
Toronto Landmarks

- City Hall
- Royal Ontario Museum
- CN Tower
- Distillery District
- Bahen Centre for Information Technology
Distillery District

Website
http://www3.thedistillerydistrict.com/

Phone Number

Address
Targeted Transmissions
Sending a Command

- City Hall
- Royal Ontario Museum
- CN Tower
- Distillery District
- Bahen Centre for Information Technology
- Casaloma
Cue Broadcasting
Broadcasting a Command
Persistent Connection
Managing Duets
Cross-Device Task Manager
VAST 2006 Contest Dataset
Space to Think (CHI ‘10)

Christopher Andrews
Alex Endert
Chris North
A delegation of the Federation of Russia will be visiting Brazil and Chile on October 31. The delegation is led by Sergey Minyev, the President of the Federation Council, and will meet with José Sá, the Federal Senate President of Brazil. The delegation will also meet with the President Ney Lopes of the National Congress.

On November 4, a Russian delegation will visit an international air show in Novosibirsk. The delegation is scheduled to meet with President Ricardo Lagos.

This month marks the one-year anniversary since Lisa Ramirez and her husband, Sam, purchased the Alderwood Mini Mart on the corner of Sixth Street and Harrison Avenue. In that time, Lisa has become very well acquainted with her customers, who begin steadily streaming into the store at about 7 a.m. every morning and are faithful throughout the day. Many of the customers walking through the door Ramirez knows by name. She knows their daily routines, what they buy, how they like the money in their wallets arranged and what time they will walk through the door every day. "I have a lot of customers who come every day," said Ramirez. "Most of her customers live in the neighborhood, but she said that she also has numerous cut-of-town visitors coming to her business. She said that people from Arizona, Utah, and other states come to her store looking for directions or a place to eat. Some have even asked for directions to the hospital. "It's amazing how many people visit this town," said Ramirez. "I get a lot of people here asking where the Dairy Fair is or how to get to the winery," she added. Despite all of the visitors, the Alderwood Mini Mart is still a neighborhood store. When Ramirez first bought the business, it was slow, but with a few changes, including ripping the sign out of the window, she saw an increase in business. Through the summer there was a steady stream of business, she said. Ramirez had a desire to own her own business for a number of years. A former medical transcriptionist and assistant for a lab, she
Project Components

- Ethnographic research
- Interaction design
- Development tools
Duet: Exploring joint interactions on a smart phone and a smart watch
duet  a unified interactive platform on a smart phone & a smart watch
Overview Video
<table>
<thead>
<tr>
<th></th>
<th>Watch Foreground</th>
<th>Watch Background</th>
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</thead>
<tbody>
<tr>
<td><strong>Phone Foreground</strong></td>
<td>![Phone Image]</td>
<td>![Phone Image]</td>
</tr>
<tr>
<td><strong>Phone Background</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone Foreground</td>
<td></td>
<td></td>
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<tr>
<td>------------------</td>
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</tr>
<tr>
<td>Watch Foreground</td>
<td>Watch Background</td>
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<tr>
<td><strong>Phone as a primary input and output platform;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Watch as an input device and extended display.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How can content producers target unknown device combinations?
Panelrama: Enabling easy specification of cross-device web applications
WORE
Panelrama
WHAT IS HCI?
<table>
<thead>
<tr>
<th>Panel Type</th>
<th>Physical Size</th>
<th>Keyboard Quality</th>
<th>Touch Quality</th>
<th>Proximity to User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Panel</td>
<td>●●●●●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playback Panel</td>
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<td>●●●●●●●</td>
<td>●●●●●</td>
<td>●●●●●●●</td>
</tr>
<tr>
<td>Search Panel</td>
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<td>●●●●●●●</td>
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<td>Related Videos</td>
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<td>●●●●●●●</td>
<td>●●●●●</td>
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</table>
3. Modeling Devices

<table>
<thead>
<tr>
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<th>Keyboard Quality</th>
<th>Touch Quality</th>
<th>Proximity to User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Panel</td>
<td>• • • • •</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>• • • • •</td>
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</tr>
<tr>
<td>Search Panel</td>
<td>• • •</td>
<td>• • • • •</td>
<td>• • • • •</td>
<td>• • •</td>
</tr>
<tr>
<td>Related Videos</td>
<td>• • • •</td>
<td></td>
<td>• • • • •</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Physical Size</th>
<th>Keyboard Quality</th>
<th>Touch Quality</th>
<th>Proximity to User</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG 50” TV</td>
<td>• • • • •</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dell Laptop PC</td>
<td>• • • • •</td>
<td>• • • • •</td>
<td></td>
<td>• •</td>
</tr>
<tr>
<td>Apple iPad</td>
<td>• • • •</td>
<td>• • • • •</td>
<td>• • • • •</td>
<td>• • • •</td>
</tr>
<tr>
<td>Nexus 4 Phone</td>
<td>• • • • •</td>
<td>• • • • •</td>
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<td>• • • • •</td>
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</tbody>
</table>
<body>

<div>
  <canvas id="drawingCanvas">
  </canvas>
</div>

<div>
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  <button type="button" id="green"/>
  <button type="button" id="blue"/>
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</body>
<body>

<div>
  <canvas id="drawingCanvas">
  </canvas>
</div>

</body>
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