Responsive mobile design in practice

Kirill Grouchnikov
Android, Google Inc.
this talk is about minimizing the pain of developing for multiple form factors
<table>
<thead>
<tr>
<th>Device</th>
<th>Screen Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archos 2.8”</td>
<td></td>
</tr>
<tr>
<td>Experia Pro 3.7”</td>
<td></td>
</tr>
<tr>
<td>Flyer 7”</td>
<td></td>
</tr>
<tr>
<td>Galaxy Note 5.2”</td>
<td></td>
</tr>
<tr>
<td>Galaxy Tab 8.9”</td>
<td></td>
</tr>
<tr>
<td>Sony Tablet S 9.4”</td>
<td></td>
</tr>
<tr>
<td>Toshiba Excite 13”</td>
<td></td>
</tr>
</tbody>
</table>
device orientation

1024*600   600*1024
adapting to the context
maps

“show more” of the infinite canvas
settings

combine two (or more) screens in a multi-pane layout
youtube (view)

promote two tabs into the side panel
play store (details)

rearrange content in two columns
responsive mobile design
same content, same hierarchy adapting to context
same content, same hierarchy adapting to context
minimizing the pain of developing for multiple form factors
same content, same hierarchy
differently stacked “blocks”
DESCRIPTION

The follow-up to the award-winning mobile game Cut the Rope has arrived for Android! ZeptoLab's Cut the Rope: Experiments
Cut the Rope is awesome! 🌟🌟🌟🌟🌟 Gabriel 4/6/12
Samsung Stratosphere
Zeptolab, I rated it 5 stars because we are coming home from our vacation in CO, and I was playing Cut the Rope Experiments and it didn’t even give one single error. I was so proud of it that's why I made this review :)

MORE BY ZEPTOLAB

DESCRIPTION
The follow-up to the award-winning mobile game Cut the Rope has arrived for Android! Zeptolab’s Cut the Rope: Experiments features the familiar and loveable little monster Om Nom who is discovered by a mad (but not bad) scientist determined to

REVIEWs

Average 5 stars 3,657
4.8 236
4 stars 26
3 stars 68
2 stars 102
1 star 4,089

Great
🌟🌟🌟🌟🌟 Kris 4/2/12
HTC Thunderbolt
Just as fun as the original. And side note, why do people give poor ratings if it didn’t download correctly? You never actually played it so don’t rate it.

Perfect Sequel
🌟🌟🌟🌟🌟 David 4/2/12
This is a perfect sequel to the original. Love all the new puzzles and new things you can do. spent many hours on this :)
same blocks rearranged in two columns
DESCRIPTION
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Cut the ropes, release candy into Om Nom's mouth, collect shiny gold stars, and

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See all

USERS ALSO VIEWED
- Cut the Rope
- Where's My Water?
- Cut'n'Roll
- Slice It!
- Move the Box
- Cut and Slice

GOOGLE PLAY CONTENT
Flag as inappropriate
Tell Google if you find the app or this screen has objectionable content.
same building block on the same screen on different form factors
same building block in different screens
Mission: Impossible
Ghost Protocol
ACTION AND ADVENTURE
RENT $3.99
515
RATED: PG-13
December 2011
132 minutes
Scott Main +1’d this.
res/layout/youtube_trailer_section.xml

<com.my.package.YoutubeTrailerSection>
  <ImageView
    android:id="@+id/thumbnail"
    android:background="black" />
  <ImageView
    android:id="@+id/play_icon"
    android:src="@drawable/ic_video_play" />
  <TextView
    android:id="@+id/duration"
    android:textColor="#CCCCCC"
    android:background="#4C000000"
    android:textSize="@dimen/content_primary" />
</com.my.package.YoutubeTrailerSection>
public class YoutubeTrailerSection
extends TheMostSuitableBaseLayout

@Override onFinishInflate()
bind(YoutubeTrailerData)

@Override onMeasure() - if needed
@Override onLayout() - if needed
private ImageView mThumbnail;
private TextView mDuration;

@Override
protected void onFinishInflate() {
    super.onFinishInflate();
    mThumbnail = (ImageView) findViewById(R.id.thumbnail);
    mDuration = (TextView) findViewById(R.id.duration);
}
private ImageView mThumbnail;
private TextView mDuration;

@Override
protected void onFinishInflate() {
    super.onFinishInflate();
    mThumbnail = (ImageView) findViewById(R.id.thumbnail);
    mDuration = (TextView) findViewById(R.id.duration);
}

public void bind(YoutubeTrailerData data) {
    mDuration.setText(data.getFormattedLength());
    String thumbnailUrl = data.getThumbnailUrl();
    ImageUtils.load(mThumbnail, thumbnailUrl); // cache / network app code
    setOnClickListener(new View.OnClickListener() {
        public void onClick(View view) {
            Intent youtubeIntent = IntentUtils.createYoutubeIntent(data.getVideoUrl());
            getContext().startActivity(youtubeIntent);
        }
    });
}
why so much trouble with a custom class?
encapsulation
<include
    layout="@layout/youtube_trailer_section" />

YoutubeTrailerSection trailer =
    (YoutubeTrailerSection) findViewById
    (R.id.youtube_trailer_section);
trailer.bind(model.getYoutubeTrailerData());
each block is binding a subset of the data

no matter what the context is
The follow-up to the award-winning mobile game Cut the Rope has arrived for Android! Zeptolab's Cut the Rope: Experiments

...
ScreenshotsSection screenshots =
   (ScreenshotsSection) findViewById
   (R.id.screenshots_section);
screenshots.bind(model.getScreenshotsData());

TextSection description =
   (TextSection) findViewById
   (R.id.description_section);
description.bind(model.getDescriptionData());

* I can swear that some PMs seem to think that it’s really that simple
the main flow looks up a section and passes the relevant data subset
and each section handles its own data binding, events and layout tweaks
<include
  layout="@layout/screenshots_section" />

ScreenshotsSection trailer =
  (ScreenshotsSection) findViewById
  (R.id.screenshots_section);
trailer.bind(model.getScreenshotsData());
no knowledge of context, internal IDs or event handling
each block is a separate **reusable** layout
DESCRIPTION
The follow-up to the award-winning mobile game Cut the Rope has arrived for Android! ZeptoLab’s Cut the Rope: Experiments features the familiar and loveable little monster Om Nom who is determined to study his candy-loving behavior through a series of experiments.

Cut the ropes, release candy into Om Nom’s mouth, collect shiny gold stars, and
it’s like combining Lego blocks*

* except for the part where you’re stuck maintaining the code base
all I see is `<include>`s

* he was kind of a douche, fell in love with the wrong girl and after that steak it really went downhill for him. YMMV.
the code doesn’t have to be aware what is the context
<include
    layout="@layout/screenshots_section" />

ScreenshotsSection trailer =
    (ScreenshotsSection) findViewById
    (R.id.screenshots_section);
trailer.bind(model.getScreenshotsData());
welcome to the real world
<table>
<thead>
<tr>
<th>USERS ALSO VIEWED</th>
<th>MORE BY ALISA VALDES</th>
<th>USERS ALSO VIEWED</th>
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<tbody>
<tr>
<td><img src="image" alt="Glimmer" /></td>
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<td><img src="image" alt="The Thirteenth Sacrifice: A Witch" /></td>
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**font size, column count, location of rating bar in cells**
font size

res/values/font-dimens.xml
   <dimen name="content_primary_size">16sp</dimen>

res/values-sw800dp/font-dimens.xml
   <dimen name="content_primary_size">18sp</dimen>

res/values/styles.xml
   <style name="DetailsPage_Header">
       ...
       <item name="android:textSize">@dimen/content_primary_size</item>
   </style>

res/layout/pack_header.xml
   <TextView
       android:id="@+id/header"
       style="@style/DetailsPage_Header"
       ...

column count

res/values/intents.xml
    <integer name="moreby_items_per_row">2</integer>

res/values-sw800dp/intents.xml
    <integer name="moreby_items_per_row">1</integer>

public class MoreBySection
    private int mColumnCount;

    public MoreBySection(Context ctx) {
        ...
        mColumnCount = ctx.getResources().getInteger(
            R.integer.moreby_items_per_row);
    }
cell layouts

res/layout/item_cell.xml
res/layout-sw800dp/item_cell.xml

public class PackAdapter

    @Override
    public View getView(int pos, View convertView, ViewGroup parent) {
        if (convertView == null) {
            convertView = mLayoutInflater.inflate(R.layout.item_cell, parent, false);
        }

        CellViewHolder holder = (CellViewHolder) convertView.getTag();

    ... return convertView;
}
the code doesn’t have to be aware what is the context*

* if you managed to confine the differences to resource files
not exactly the same blocks
context awareness “leaking” into the code
res/values/bools.xml
   <bool name="use_two_column_layout">false</bool>

res/values-sw800dp/bools.xml
   <bool name="use_two_column_layout">true</bool>
public class BylineSection

private boolean mIsTwoColumnMode;

public BylineSection(Context ctx) {
    ...
    mIsTwoColumnMode = ctx.getResources().getBoolean(R.bool.use_two_column_layout);
}

public void bind() {
    if (mIsTwoColumnMode) {
        // add update date, download size and download count
    } else {
        // add rating count, update date, download size
        // and download count
    }
}
reuse blocks on the same screen on different form factors
<include
  layout="@layout/screenshots_section" />

ScreenshotsSection trailer =
  (ScreenshotsSection) findViewById
  (R.id.screenshots_section);
trailer.bind(model.getScreenshotsData());
reuse blocks
in different screens
<include
    layout="@layout/youtube_trailer_section" />

YoutubeTrailerSection trailer =
    (YoutubeTrailerSection) findViewById
    (R.id.youtube_trailer_section);
trailer.bind(model.getYoutubeTrailerData());
“my apps” screen
combine and share blocks
this talk was about
minimizing the pain of developing
for multiple form factors
building blocks

- identify
- encapsulate
- reuse

* almost made it through with no bullet points
Q&A

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