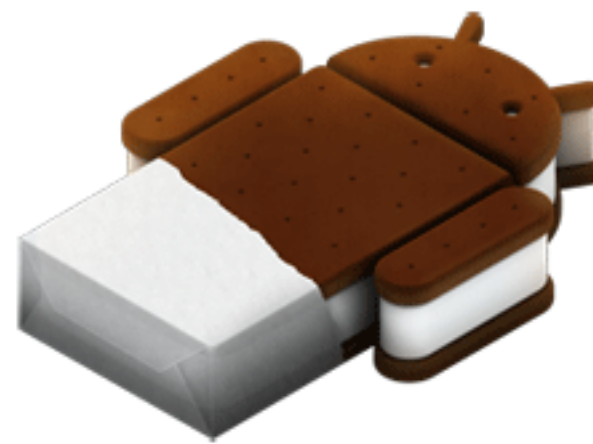


Responsive mobile design in practice

Kirill Grouchnikov
Android, Google Inc.



this talk is about

minimizing the pain of developing
for multiple form factors

device variety



Experia Pro 3.7"



Flyer 7"



Sony Tablet S 9.4"

Archos 2.8"



Galaxy Note 5.2"



Galaxy Tab 8.9"



Toshiba Excite 13"



device orientation



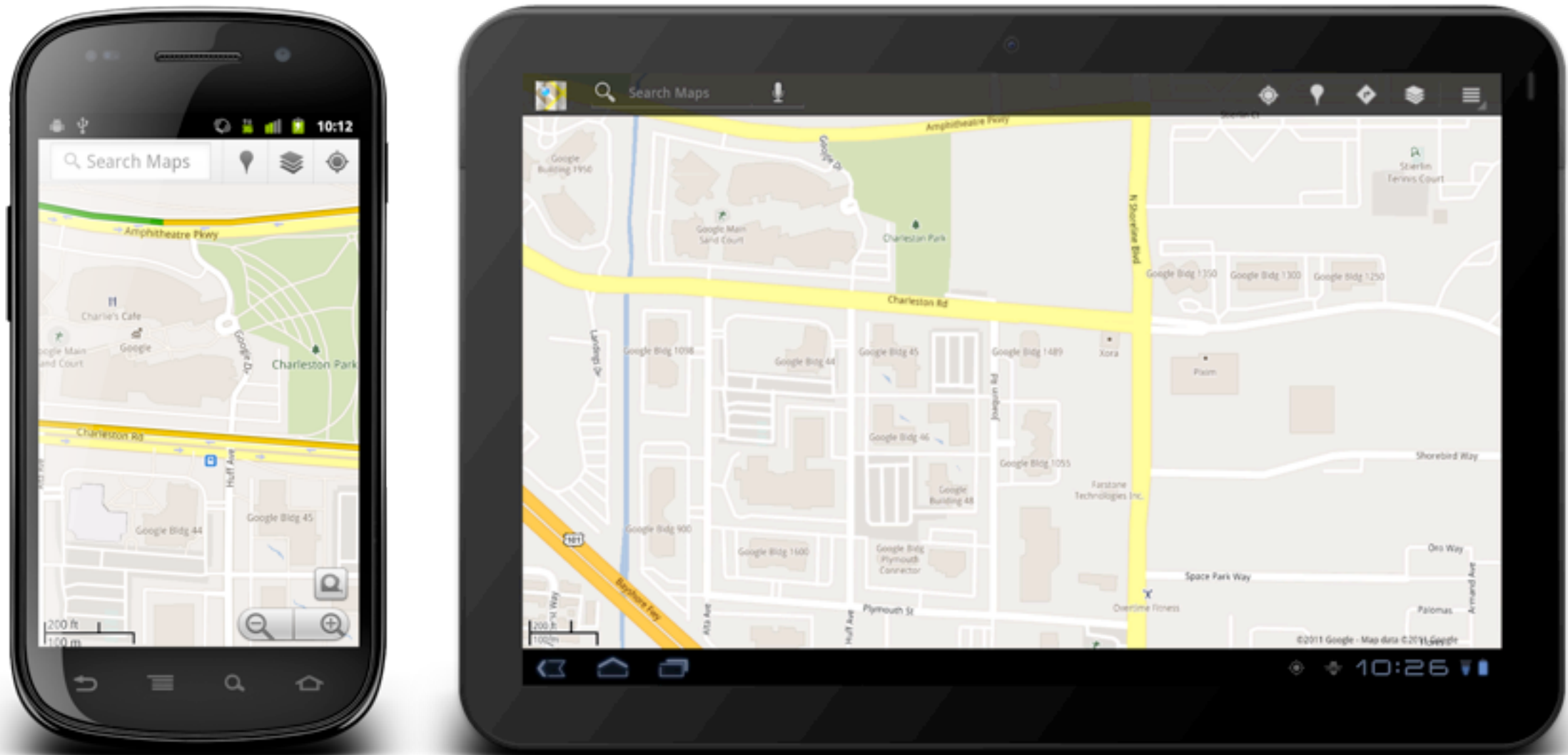
1024*600



600*1024

adapting to the context

maps



“show more” of the infinite canvas

settings



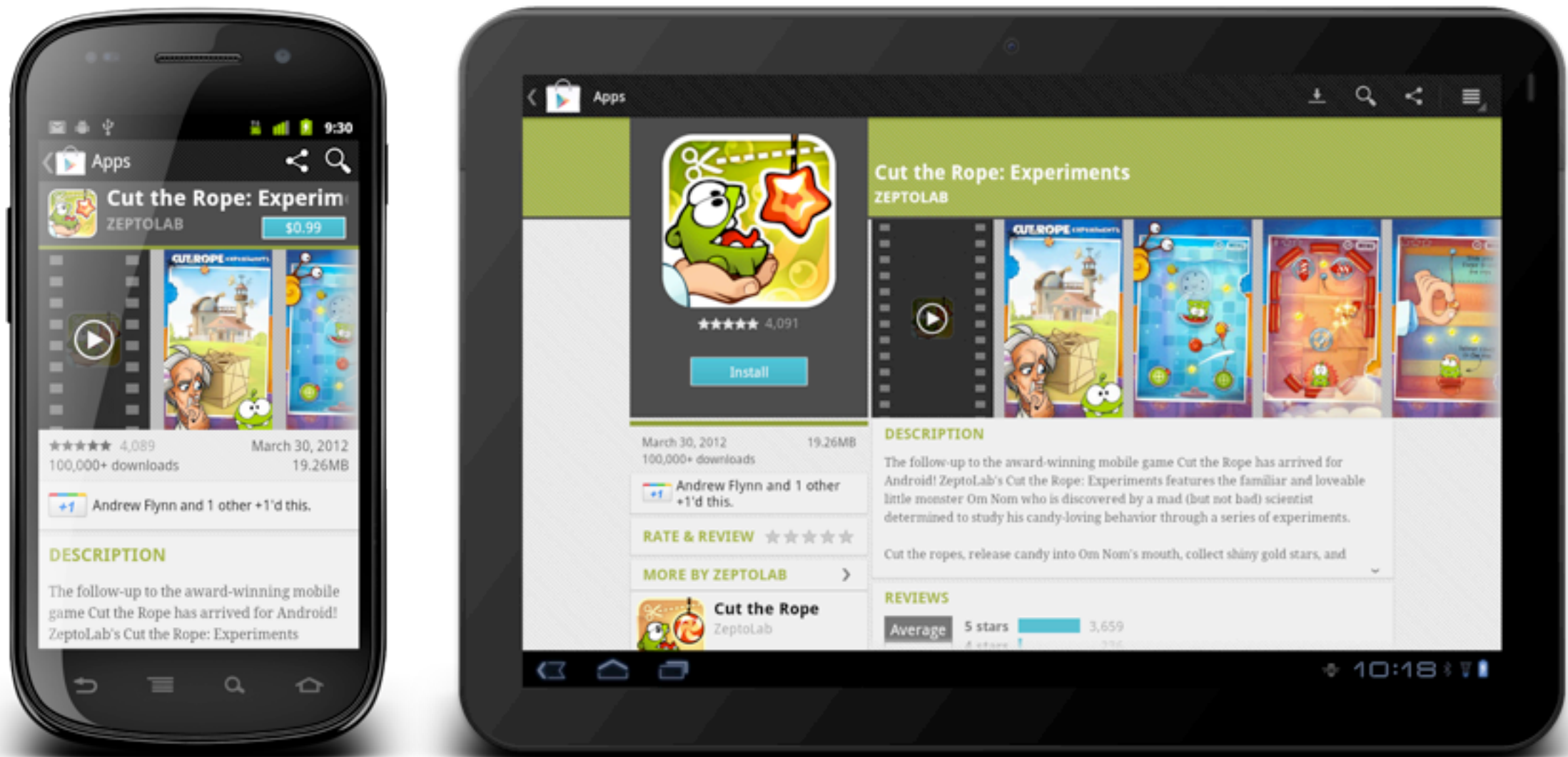
combine two (or more) screens
in a multi-pane layout

youtube (view)



promote two tabs
into the side panel

play store (details)

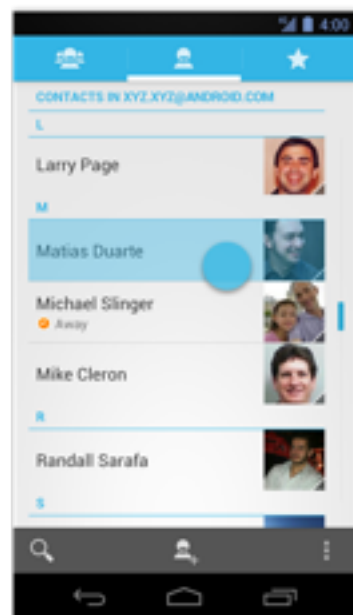


rearrange content in two columns

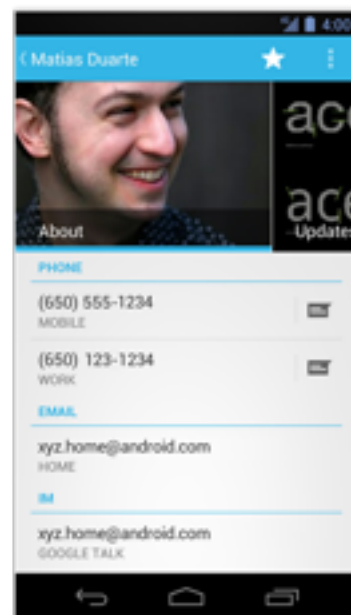
responsive mobile design

same content,
same hierarchy

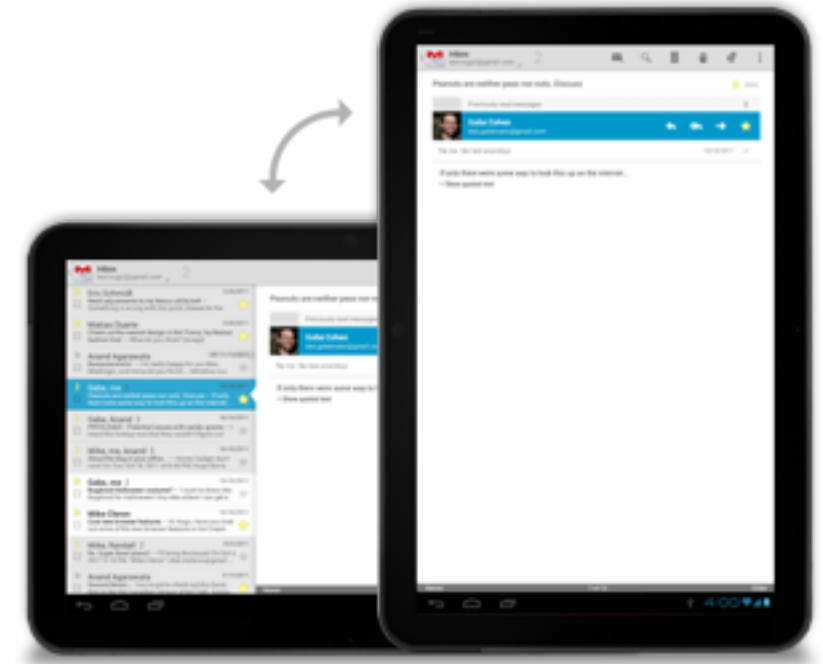
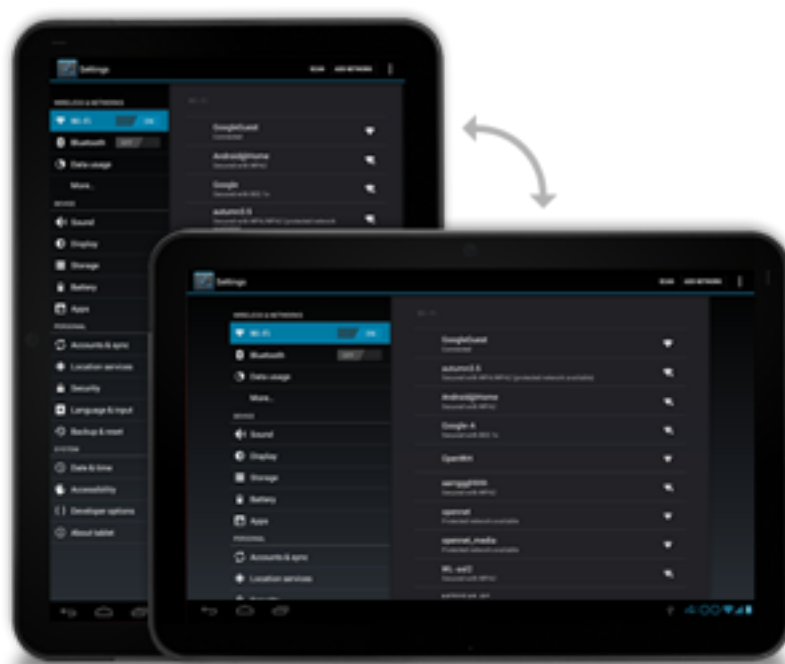
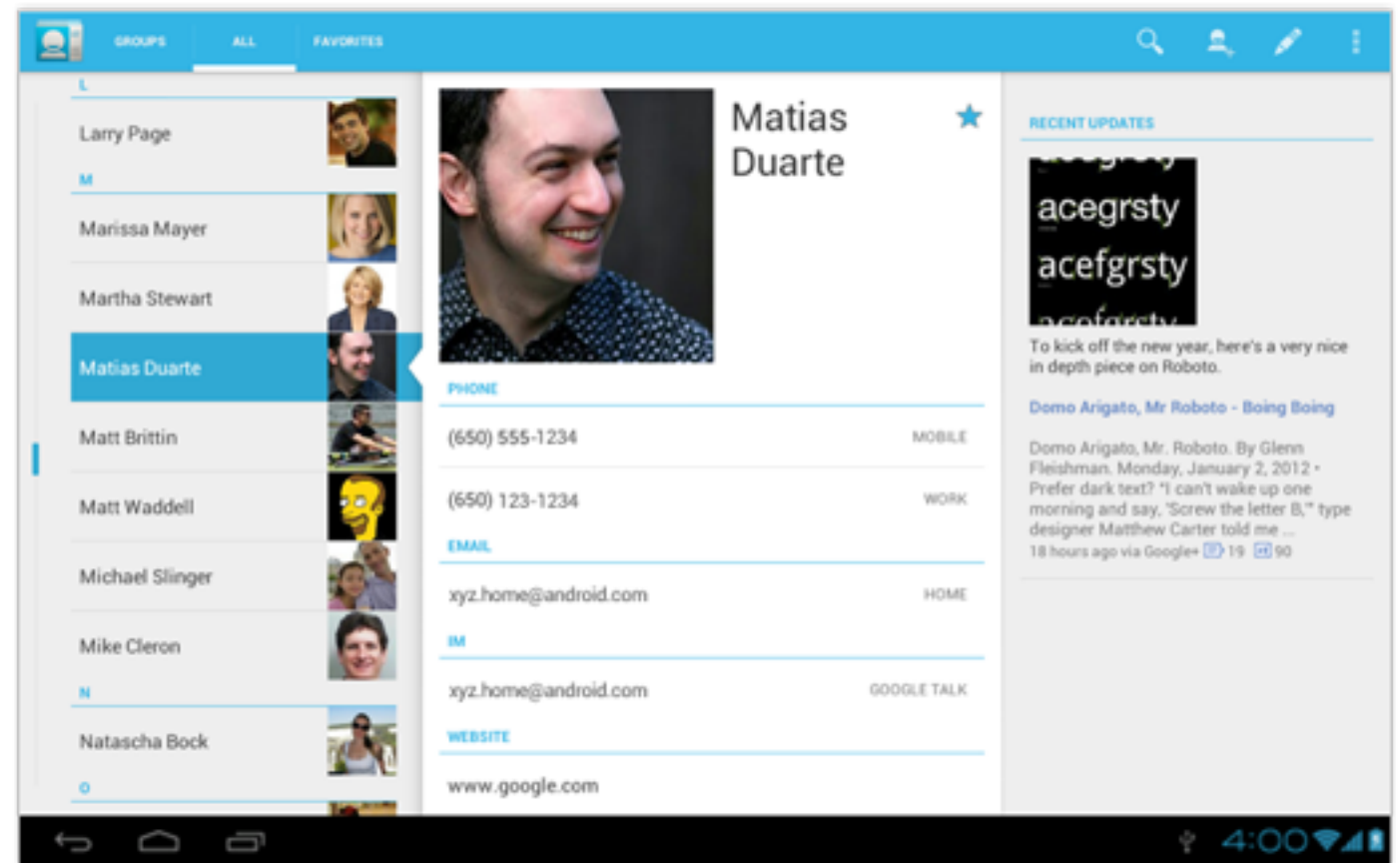
adapting to context



List view



Detail view

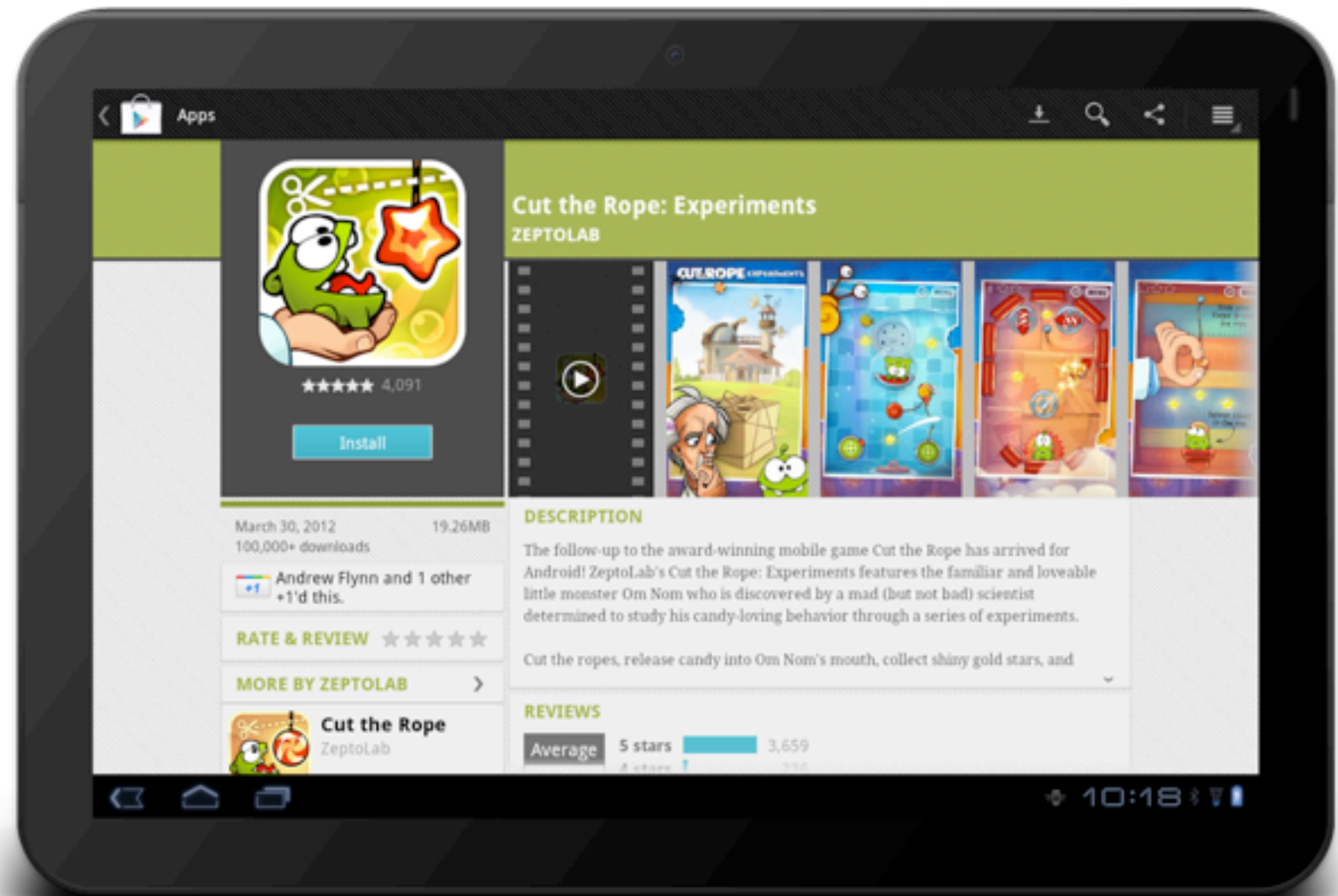
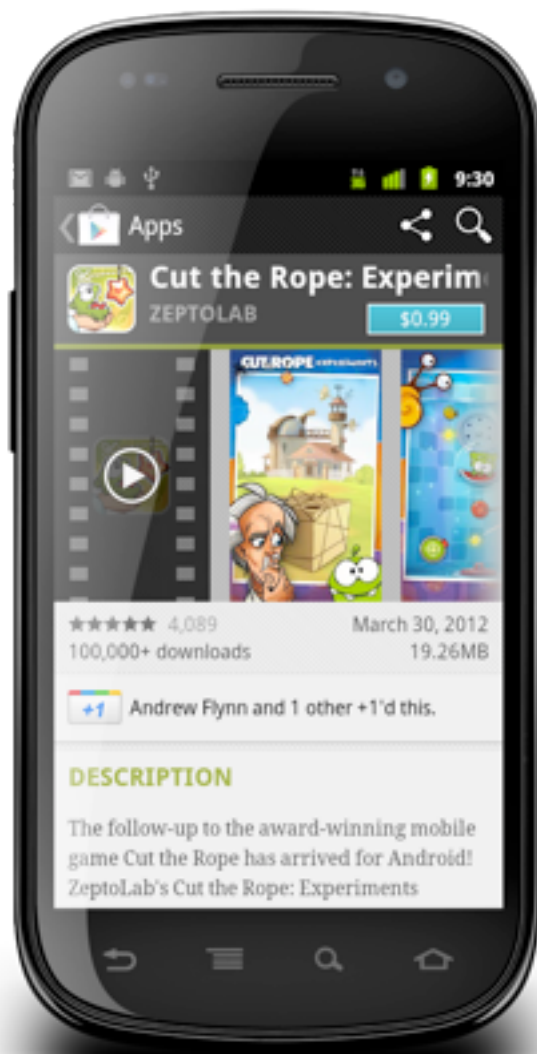


<http://developer.android.com/design/patterns/multi-pane-layouts.html>

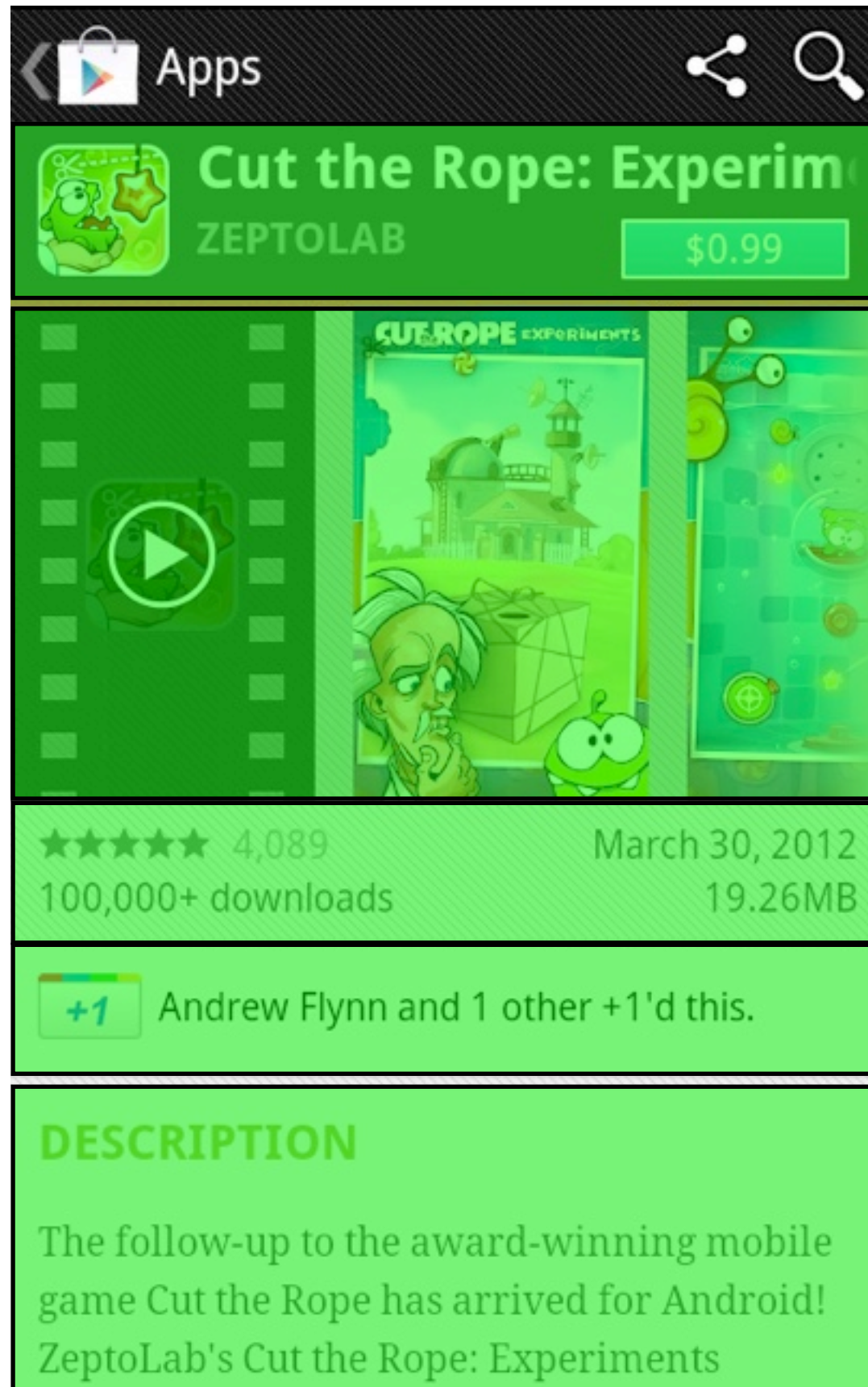
same content,
same hierarchy

adapting to context

minimizing the pain of developing
for multiple form factors



same content, same hierarchy
differently stacked “blocks”



summary

screenshots

byline

+ |

description

Apps

Cut the Rope: Experiments
ZEPTOLAB \$0.99

★★★★★ 4,089 March 30, 2012
100,000+ downloads 19.26MB

+1 Andrew Flynn and 1 other +1'd this.

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 | 4 stars | 236 |
| ★★★★★ | 3 stars | 68 |
| 4,089 | 2 stars | 26 |
| | 1 star | 102 |

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 :)

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.:)

See all >

MORE BY ZEPTOLAB >

Cut the Rope
ZeptoLab
★★★★★ Update

DEVELOPER

Visit webpage
<http://zeptolab.com>

Send email
support@zeptolab.com

USERS ALSO VIEWED >

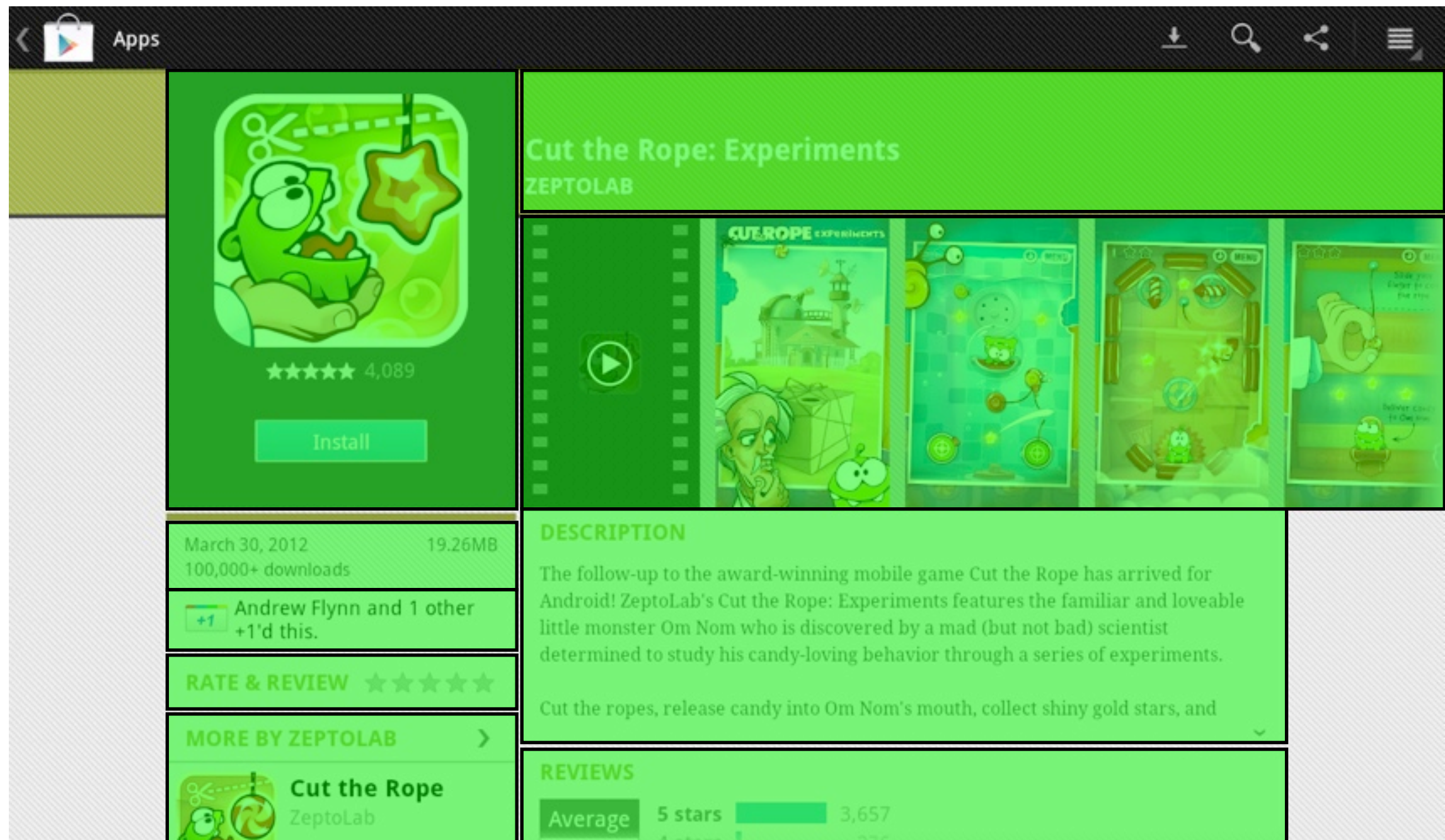
| | |
|---|--|
| Cut the Rope ZeptoLab ★★★★★ Update | Where's My Water? Disney Editors' ... Purchased |
| Cut'n'Roll genina.com ★★★★★ Free | Slice It! Com2uS ★★★★★ Free |

GOOGLE PLAY CONTENT

Flag as inappropriate
Tell Google if you find the app or this screen has objectionable content.

summary
screenshots
description
reviews
more by
developer links
cross-sell
flag content

rate & review
auto-update (apps)
trailer (movies)
song list (albums)



same blocks
rearranged in two columns

★★★★★ 4,089

Install

March 30, 2012

100,000+ downloads

Andrew Flynn and 1 other +1'd this.

RATE & REVIEW

★★★★★

MORE BY ZEPTOLAB

>

Cut the Rope

ZeptoLab

★★★★★ Update

Cut the Rope: Experiments HD

ZeptoLab

★★★★★ \$1.99

Cut the Rope HD

ZeptoLab

★★★★★ \$1.99

DEVELOPER

Visit webpage

<http://zeptolab.com>

Send email

support@zeptolab.com

Cut the Rope: Experiments

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 lovable little monster Om Nom who is discovered by a mad (but not bad) scientist 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

REVIEWS

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

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 :)

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 :)

See all >

USERS ALSO VIEWED

>

Cut the Rope

ZeptoLab

★★★★★ Update

Where's My Water?

Disney

Editors' Choice Purchased

Cut'n'Roll

genina.com

★★★★★ Free

Slice It!

Com2uS

★★★★★ Free

Move the Box

Exponenta

★★★★★ Free

Cut and Slice

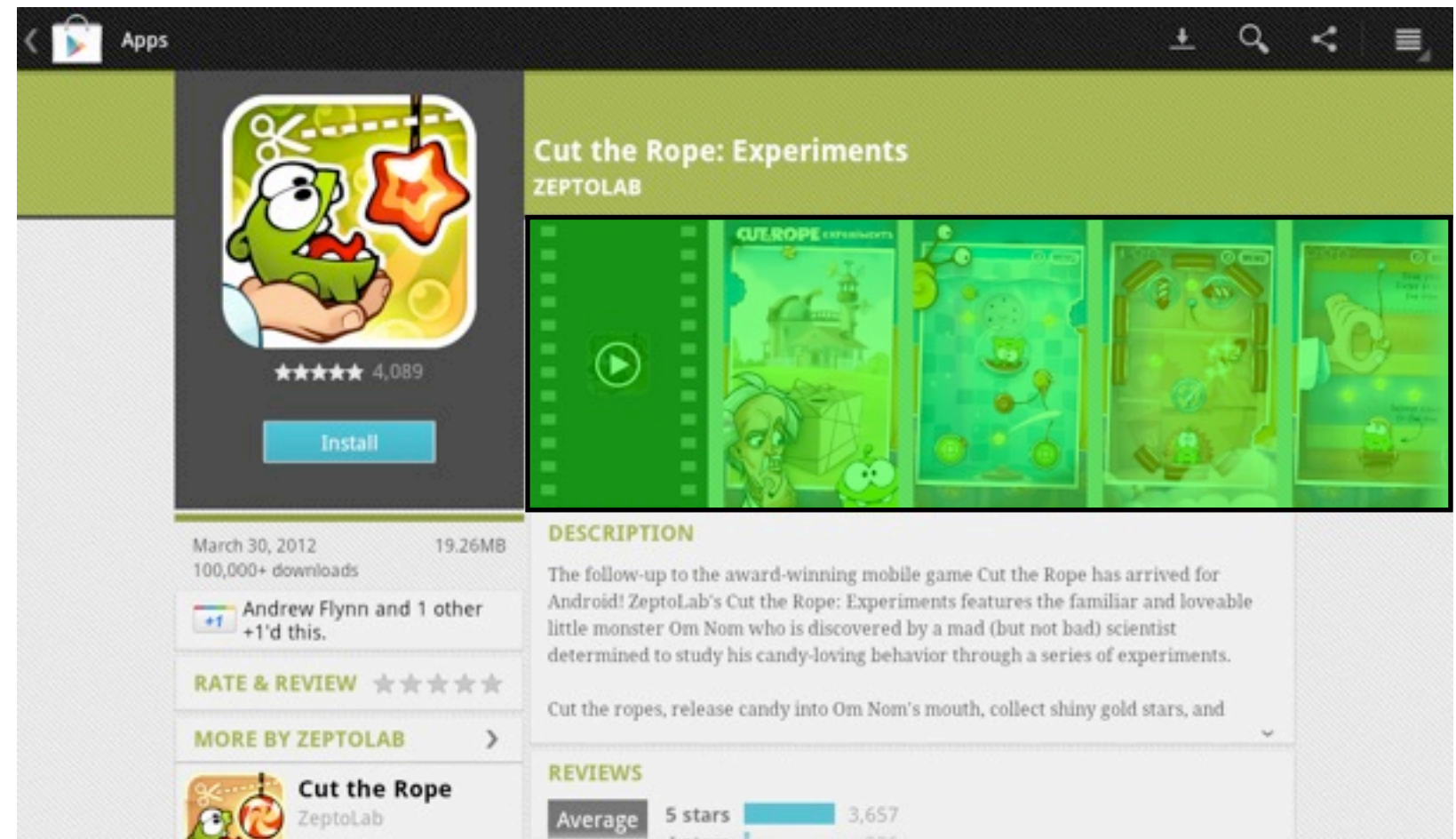
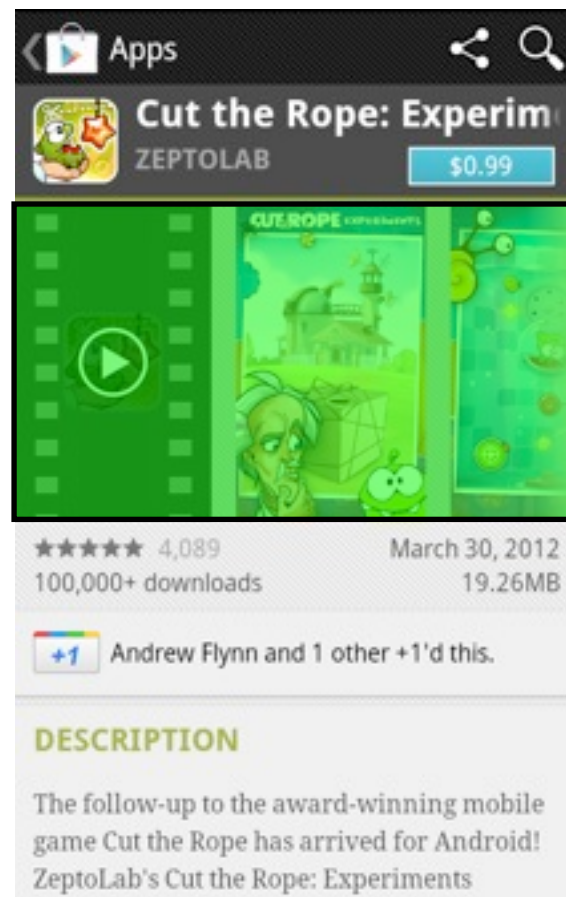
Best Addictive Brain Gam...

★★★★★ Free

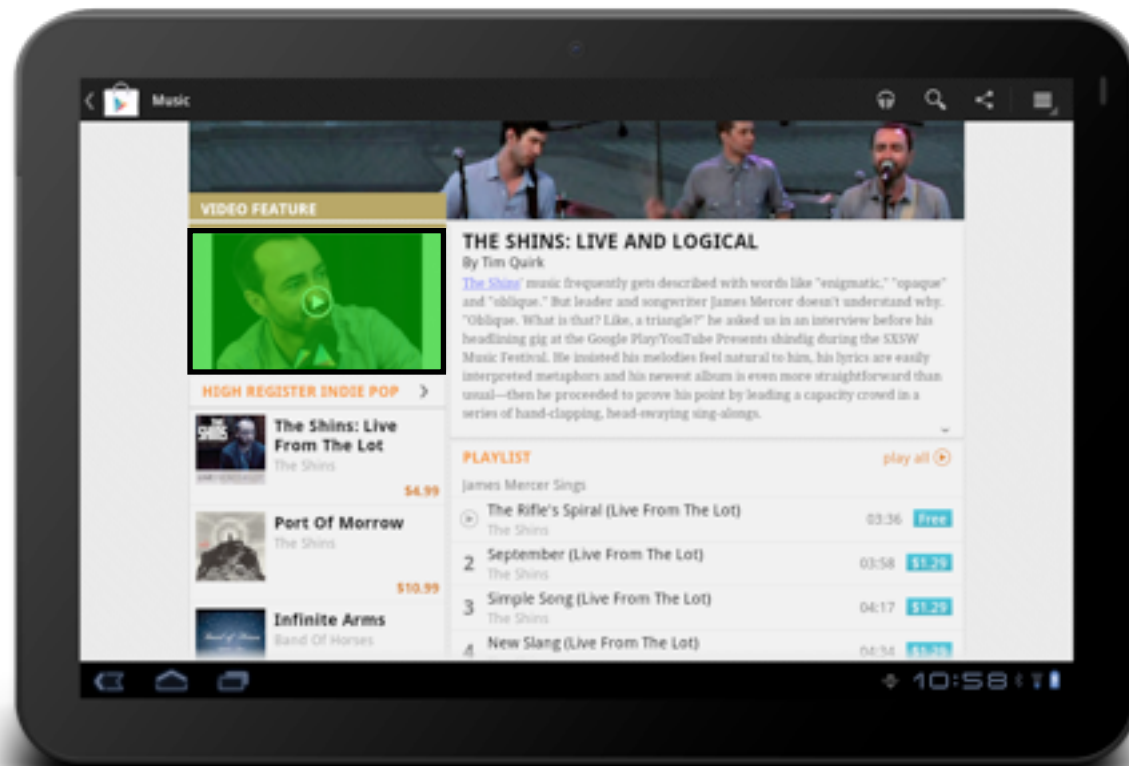
GOOGLE PLAY CONTENT

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**





res/layout/youtube_trailer_section.xml

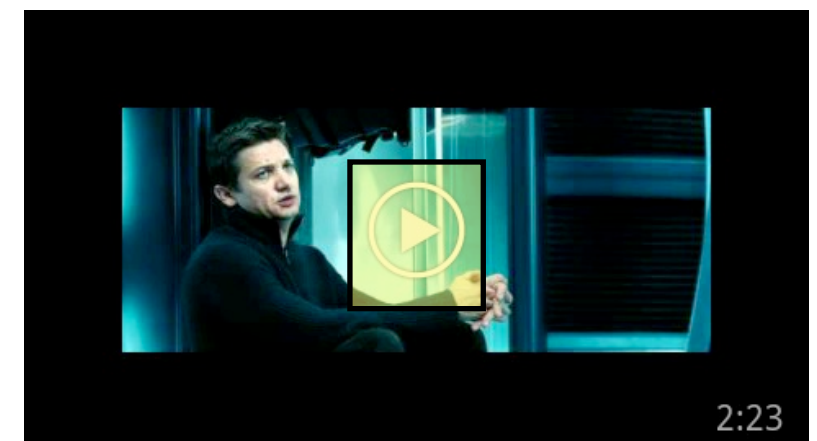
```
<com.my.package.YoutubeTrailerSection>
```

```
    <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
```

```
<com.my.package.YoutubeTrailerSection>
    <ImageView
        android:id="@+id/thumbnail"
        android:background="black" />
    <ImageView
        android:id="@+id/play_icon"    // ID not necessary if not used in code
        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>
```

```
private ImageView mThumbnail;
private TextView mDuration;
```

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

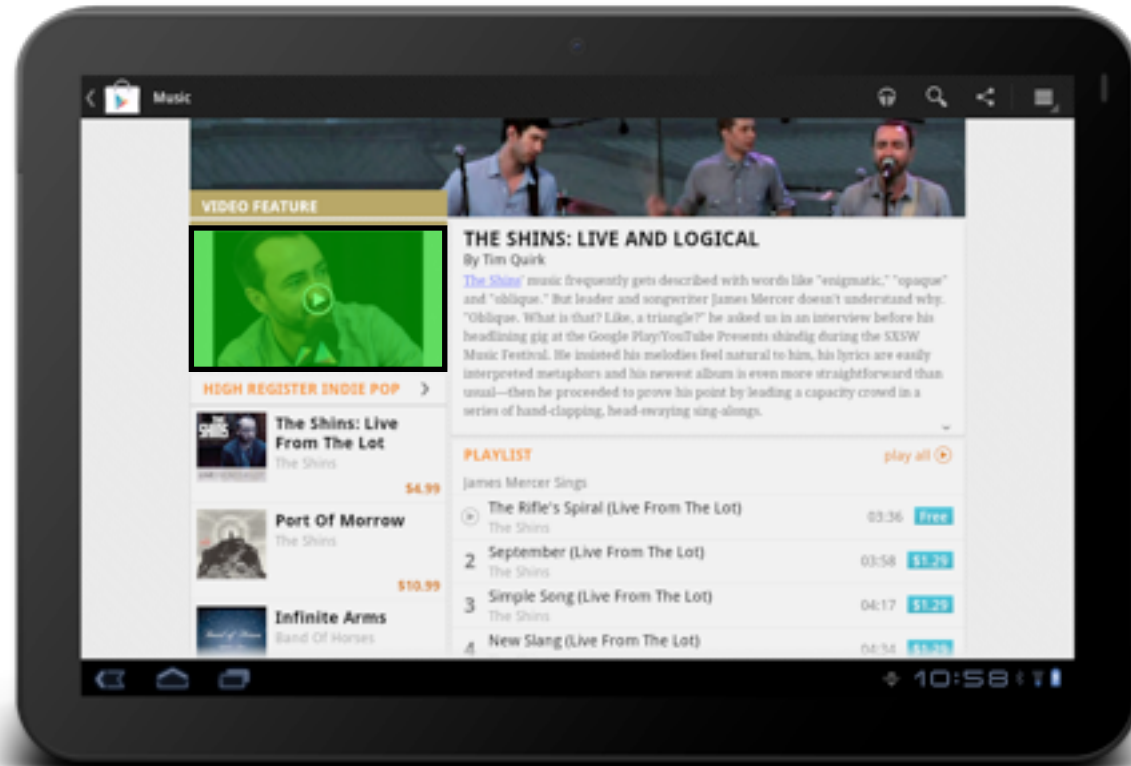
```
private ImageView mThumbnail;
private TextView mDuration;

@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);
        }
    });
}
```

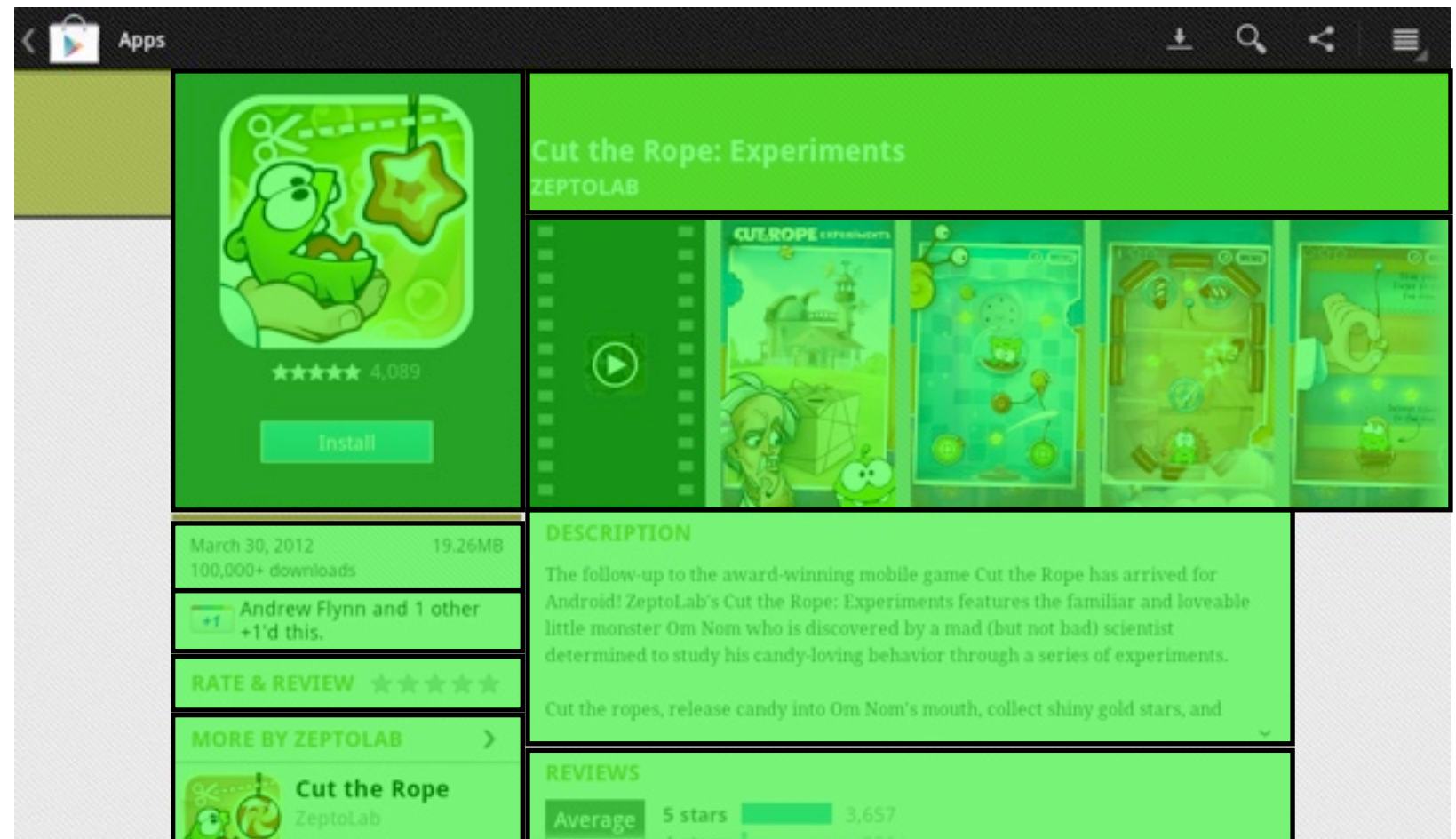
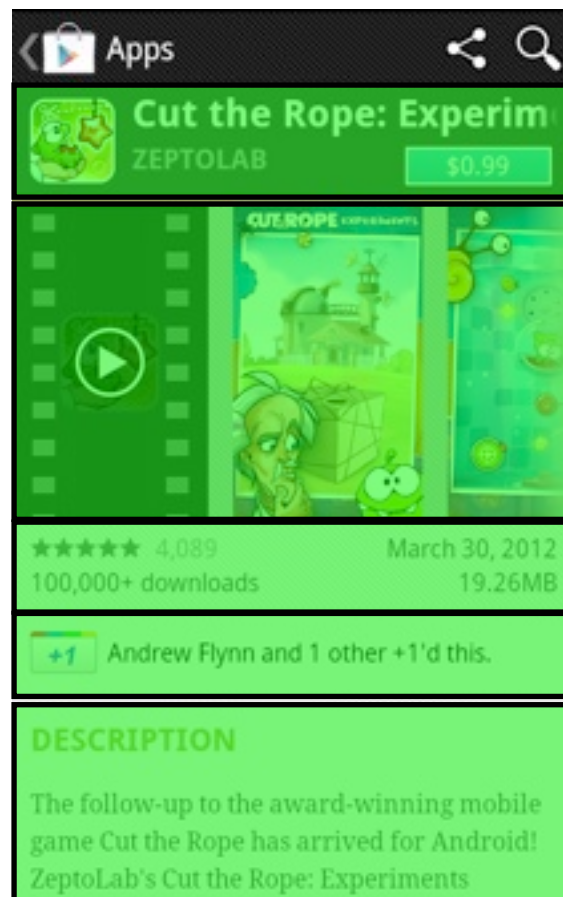
why so much trouble with a
custom class?

encapsulation

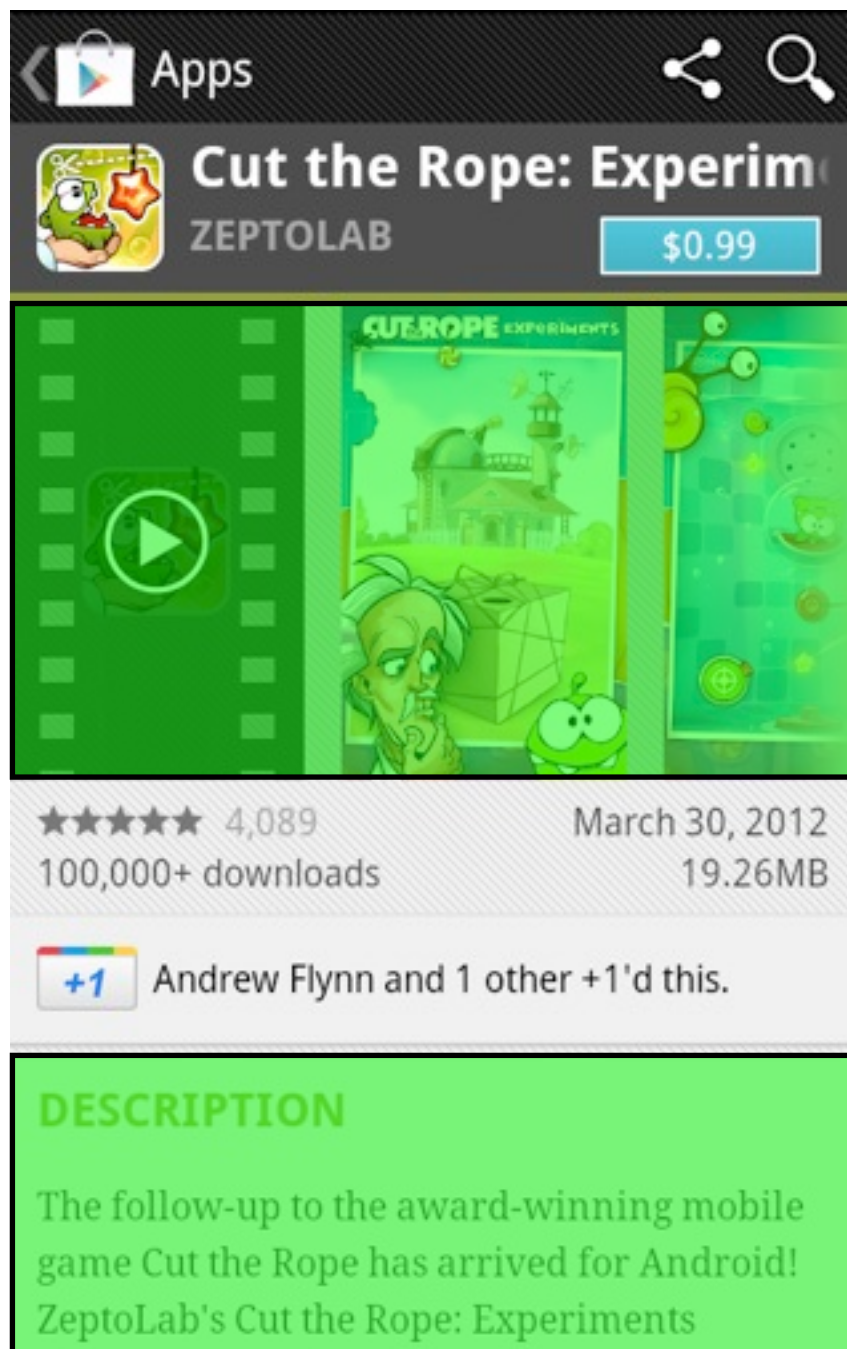


```
<include
    layout="@layout/youtube_trailer_section" />
```

```
YoutubeTrailerSection trailer =
    (YoutubeTrailerSection) findViewById
        (R.id.youtube_trailer_section);
trailer.bind(model.getYoutubeTrailerData());
```

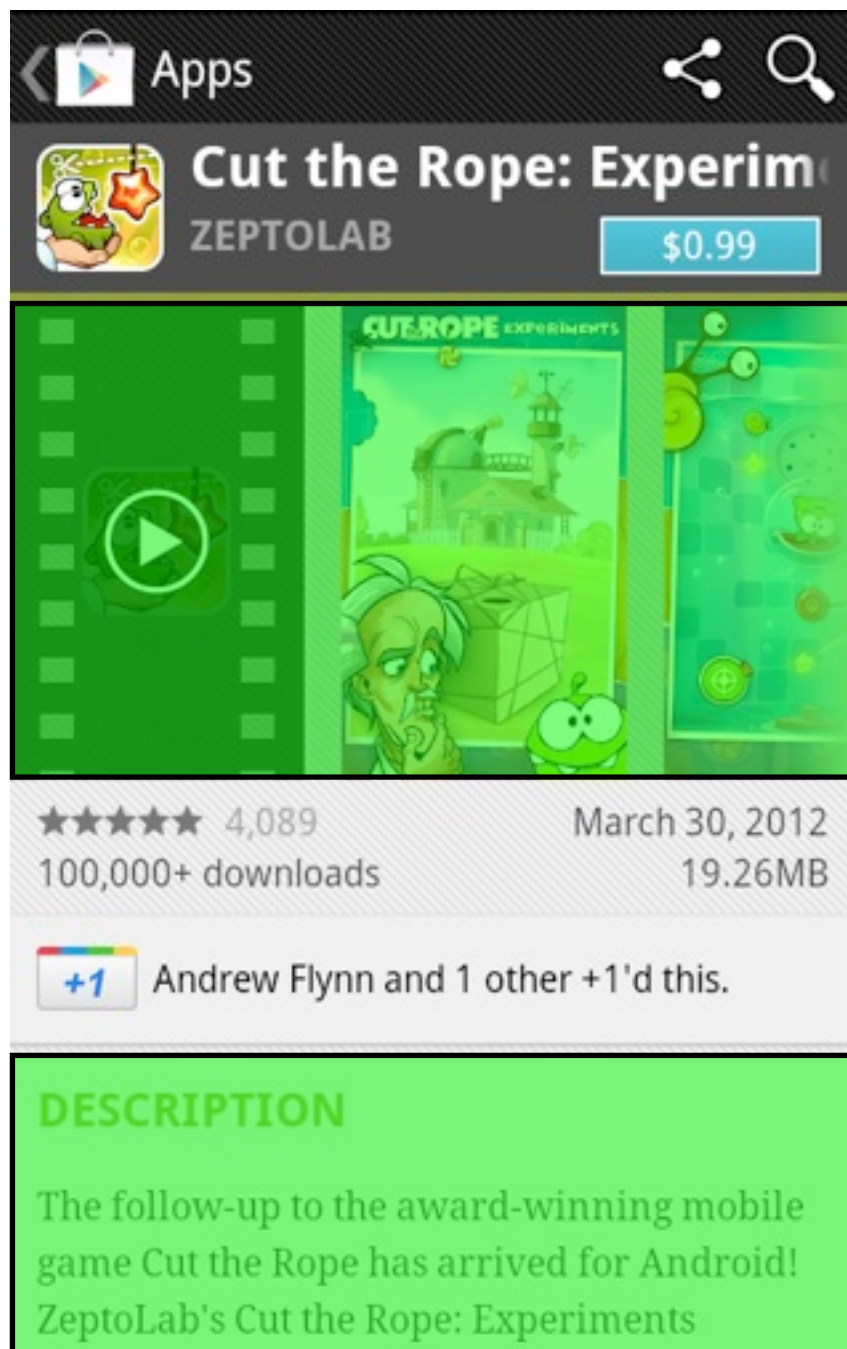
each block is binding a subset of the data
no matter what the context is



```

<include
    android:id="@+id/summary_section"
    layout="@layout/details_summary" />
<include
    android:id="@+id/screenshots_section"
    layout="@layout/details_screenshots" />
<include
    android:id="@+id/byline_section"
    layout="@layout/details_byline" />
<include
    android:id="@+id/plusone_section"
    layout="@layout/details_plusone" />
<include
    android:id="@+id/description_section"
    layout="@layout/details_text" />
...

```



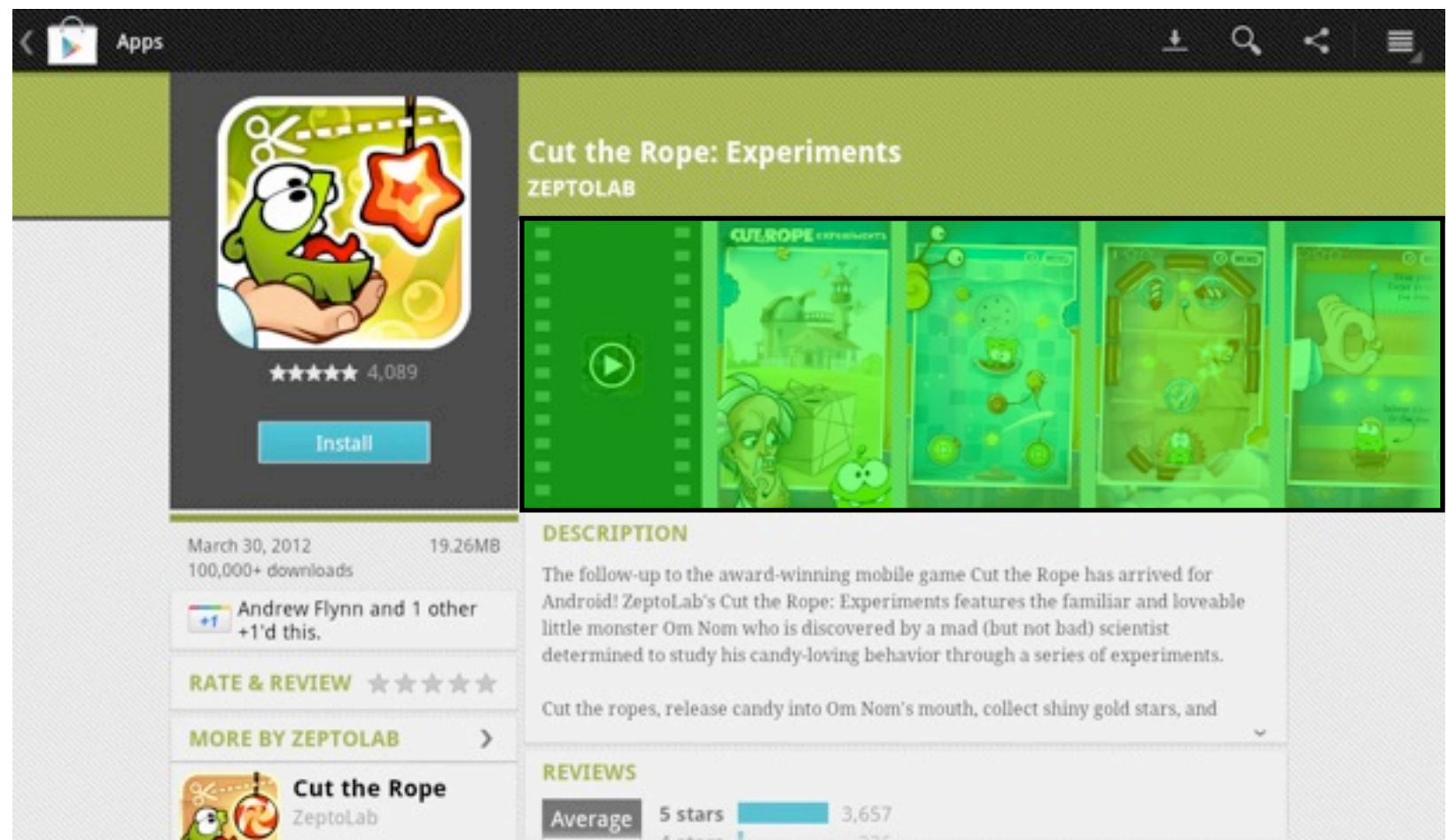
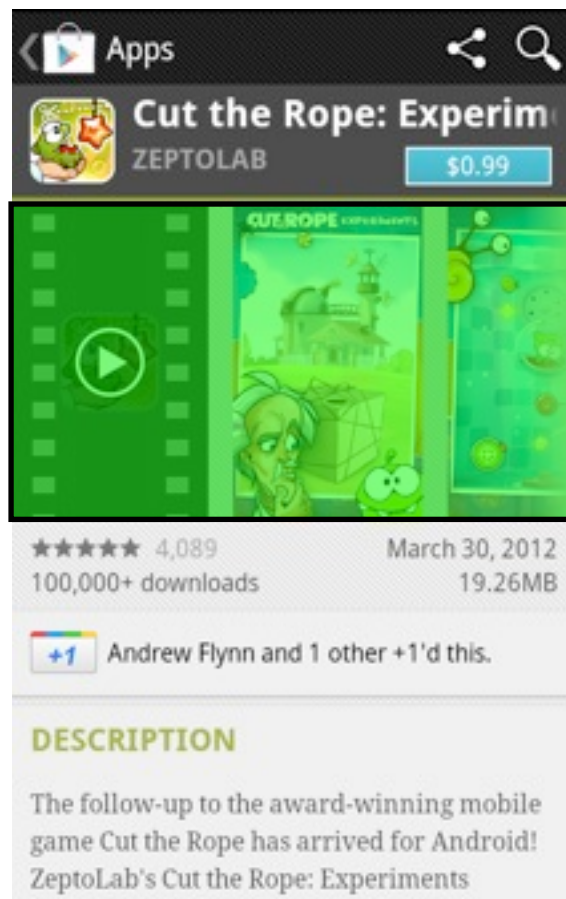
```
ScreenshotsSection screenshots =  
    (ScreenshotsSection) findViewById  
        (R.id.screenshots_section);  
screenshots.bind(model.getScreenshotsData());
```

```
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

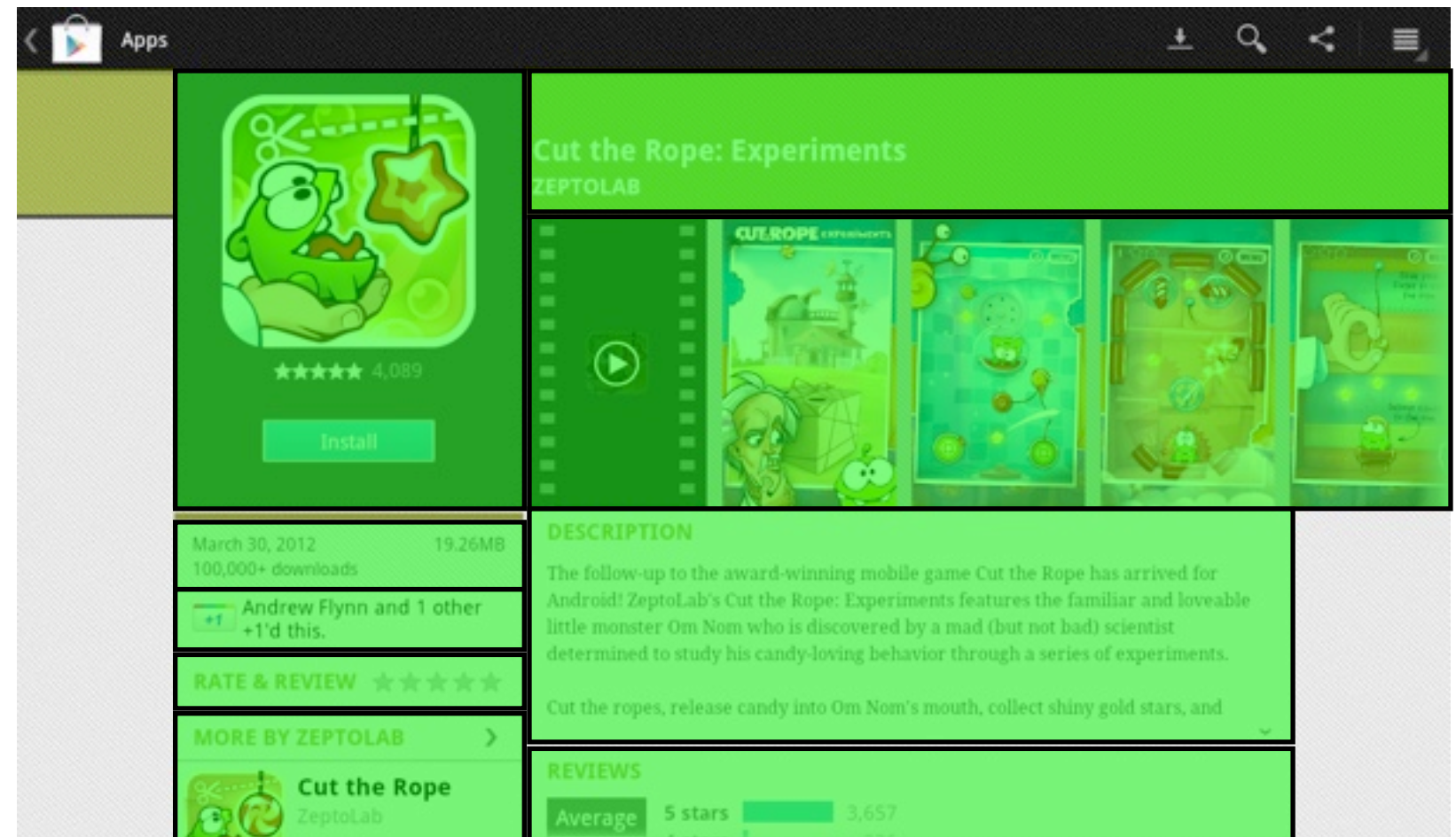
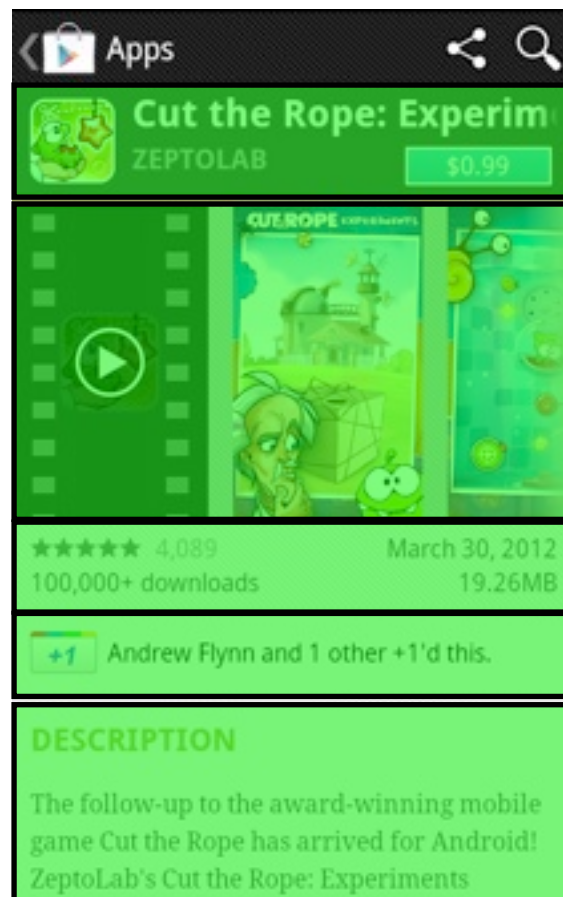
and each section handles its own
data binding, events and layout
tweaks



```
<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


Apps





Cut the Rope: Experiments

ZEPTOLAB

\$0.99





★★★★★ 4,089

March 30, 2012

100,000+ downloads

19.26MB


+1

Andrew Flynn and 1 other +1'd this.

DESCRIPTION

The follow-up to the award-winning mobile game Cut the Rope has arrived for Android! ZeptoLab's Cut the Rope: Experiments


Apps



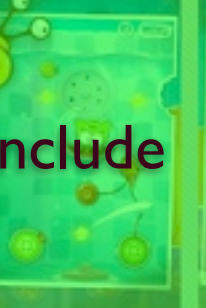



Cut the Rope: Experiments

ZEPTOLAB

Install





★★★★★ 4,089

March 30, 2012

100,000+ downloads

19.26MB


+1

Andrew Flynn and 1 other +1'd this.

RATE & REVIEW

★★★★★

MORE BY ZEPTOLAB



Cut the Rope

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 determined to study his candy-loving behavior through a series of experiments.

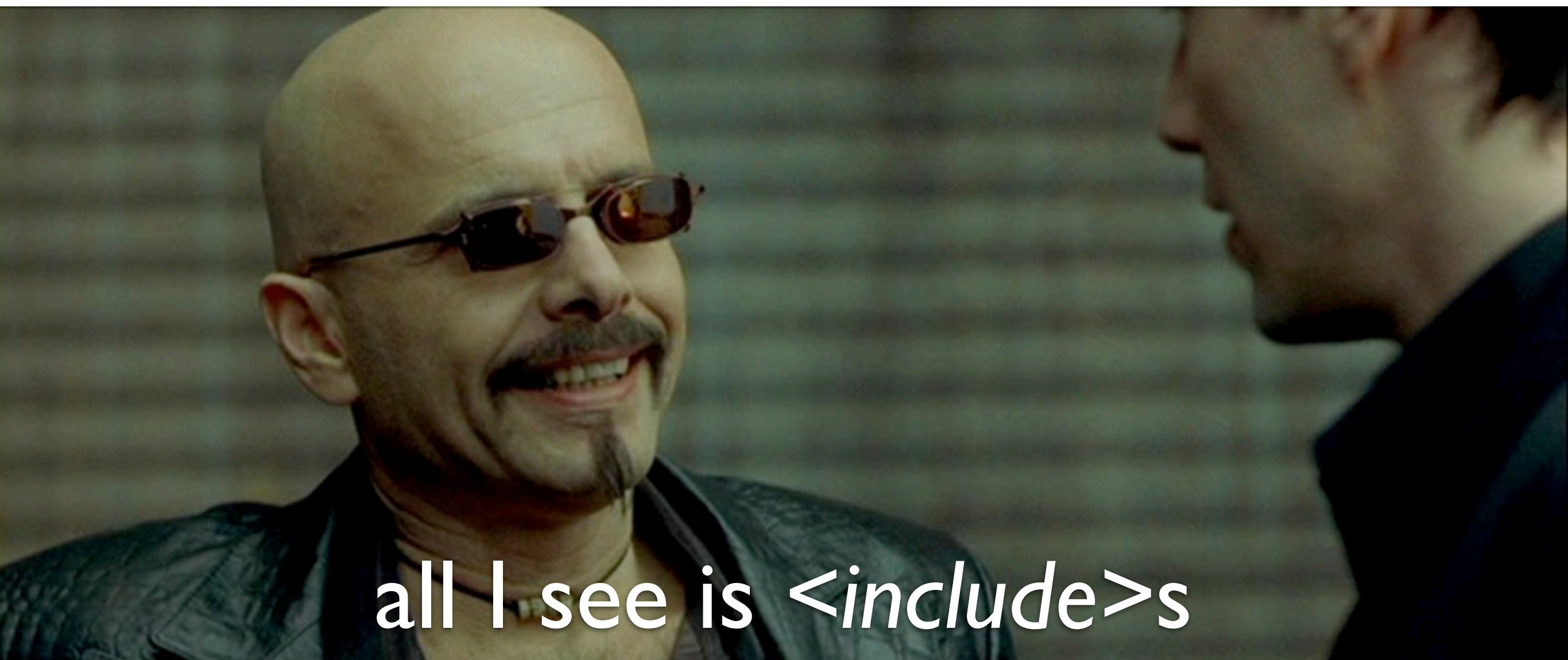
Cut the ropes, release candy into Om Nom's mouth, collect shiny gold stars, and

REVIEWS

Average 5 stars

it's like combining Lego blocks*

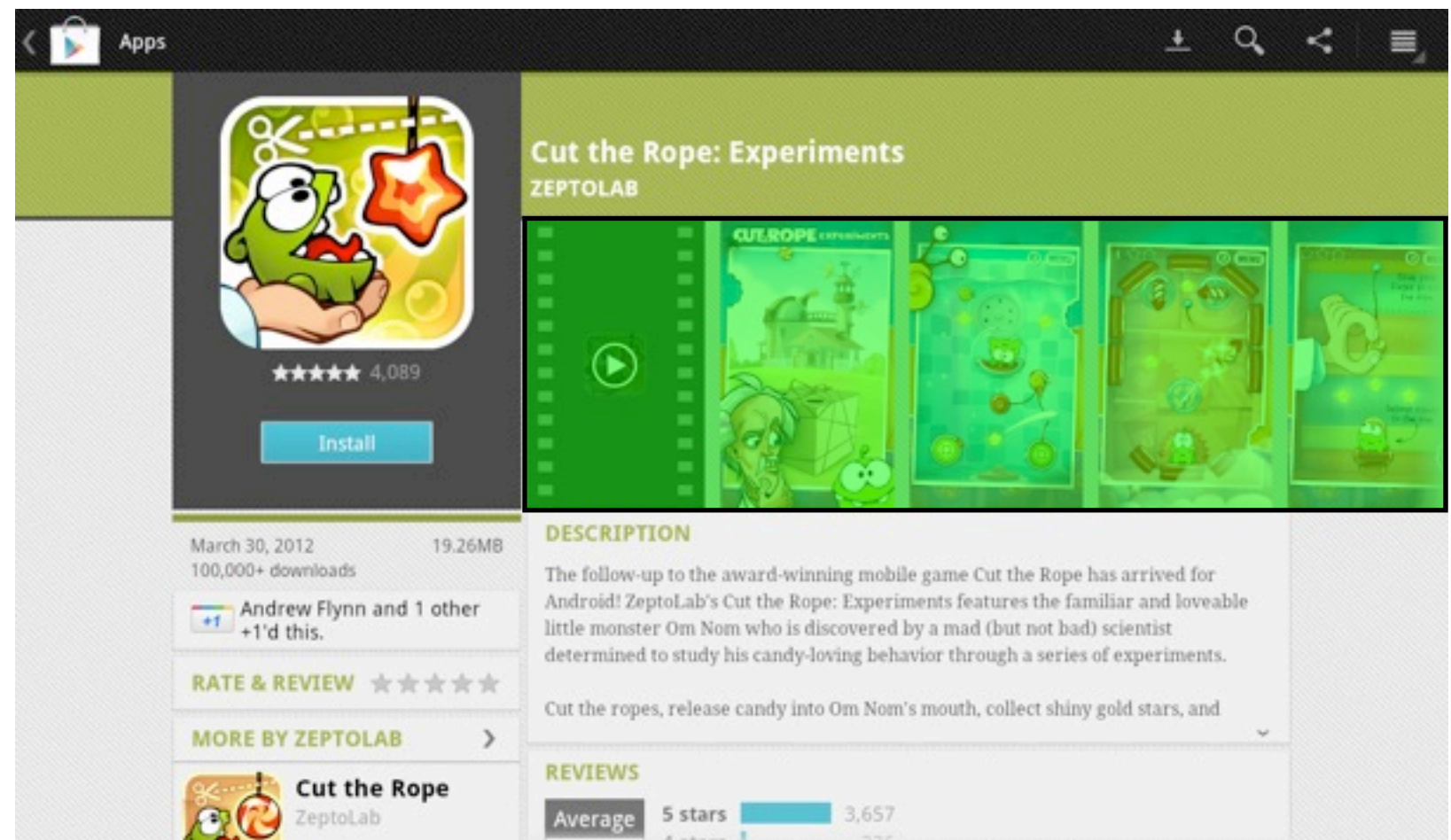
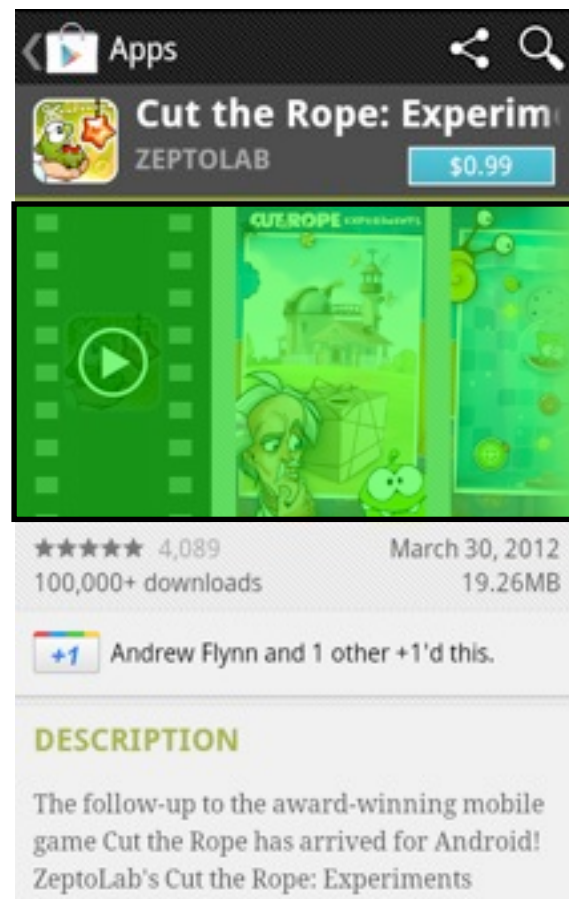
* except for the part where you're stuck maintaining the code base



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

| MORE BY ALISA VALDES > | |
|---|--|
|  The Dirty Girls Social Club Alisa Valdes-Ro... ★★★★★ \$7.99 |  Playing with Boys Alisa Valdes-Ro... ★★★★★ \$9.99 |
| USERS ALSO VIEWED > | |
|  Glimmer Phoebe Kitanidis ★★★★★ \$9.99 |  The Thirteenth Sa... Debbie Viguie ★★★★★ \$7.99 |
|  Hourglass Claudia Gray ★★★★★ \$7.99 |  Sins of the Son Linda Poitevin ★★★★★ \$7.99 |

| MORE BY ALISA VALDES > | | USERS ALSO VIEWED > | |
|---|--|---|---|
|  The Dirty Girls Social Club Alisa Valdes-Rodriguez ★★★★★ \$7.99 | |  Glimmer Phoebe Kitanidis ★★★★★ \$9.99 |  The Thirteenth Sacrifice: A Witch Debbie Viguie ★★★★★ \$7.99 |
|  Playing with Boys Alisa Valdes-Rodriguez ★★★★★ \$9.99 | |  Hourglass Claudia Gray ★★★★★ \$7.99 |  Sins of the Son Linda Poitevin ★★★★★ \$7.99 |
|  The Three Kings Alisa Valdes-Rodriguez ★★★★★ \$9.99 | |  Unraveling Elizabeth Norris ★★★★★ \$9.99 |  Daughters of the Sea #3: Lucy Kathryn Lasky ★★★★★ \$9.99 |

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/ints.xml
```

```
<integer name="moreby_items_per_row">2</integer>
```

```
res/values-sw800dp/ints.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);
```

```
    }
```

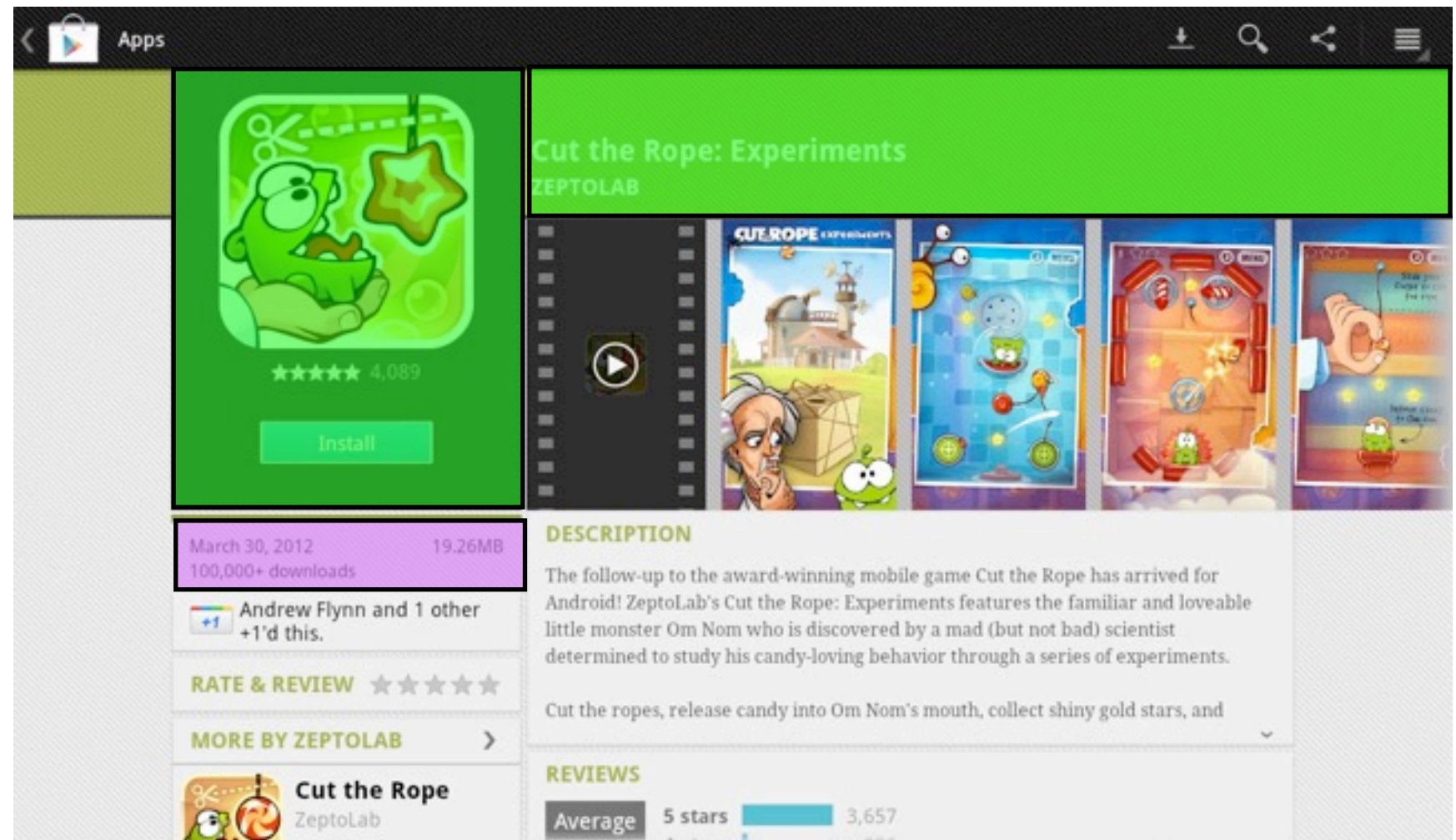
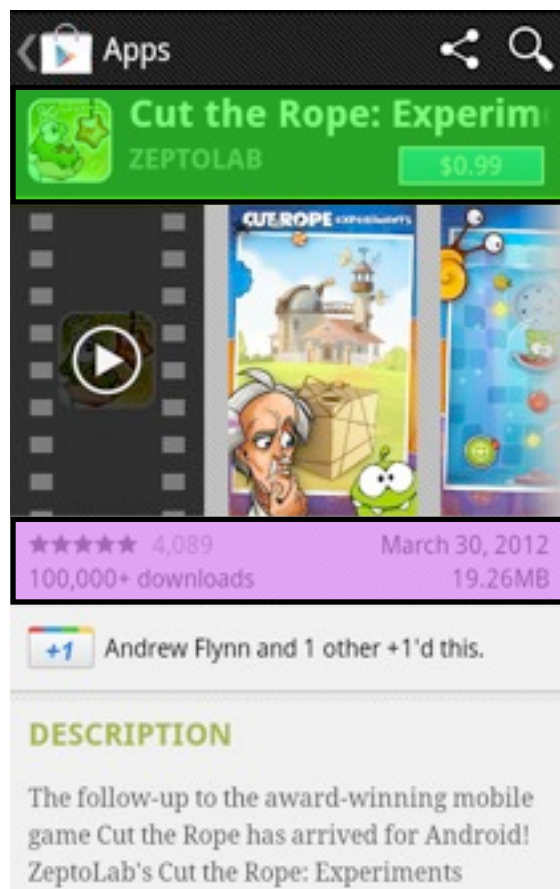
cell layouts

```
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

★★★★★ 4,089
100,000+ downloads

March 30, 2012
19.26MB

March 30, 2012
100,000+ downloads

19.26MB

```
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>
```

★★★★★ 4,089
100,000+ downloads

March 30, 2012
19.26MB

March 30, 2012
100,000+ downloads

19.26MB

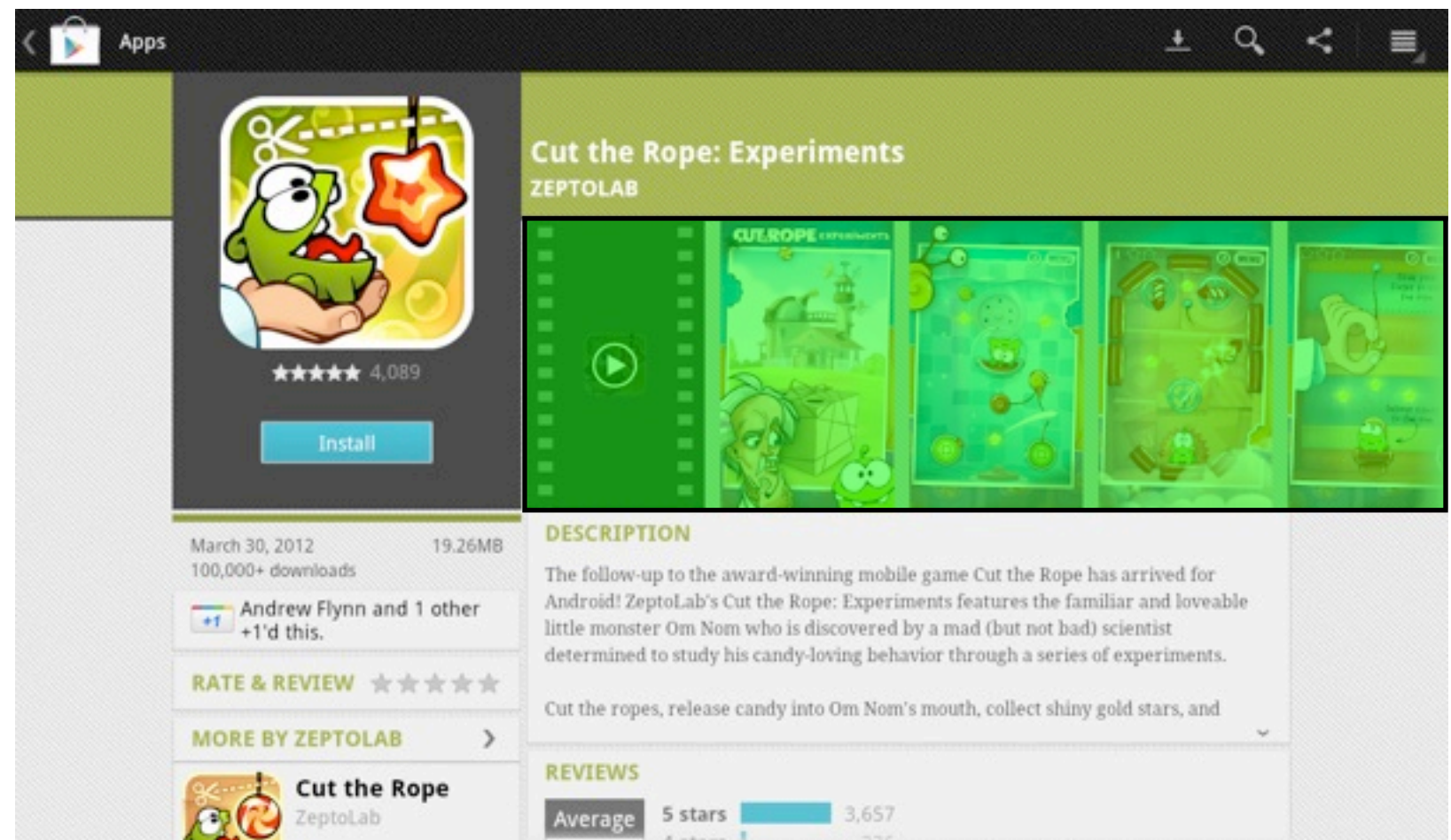
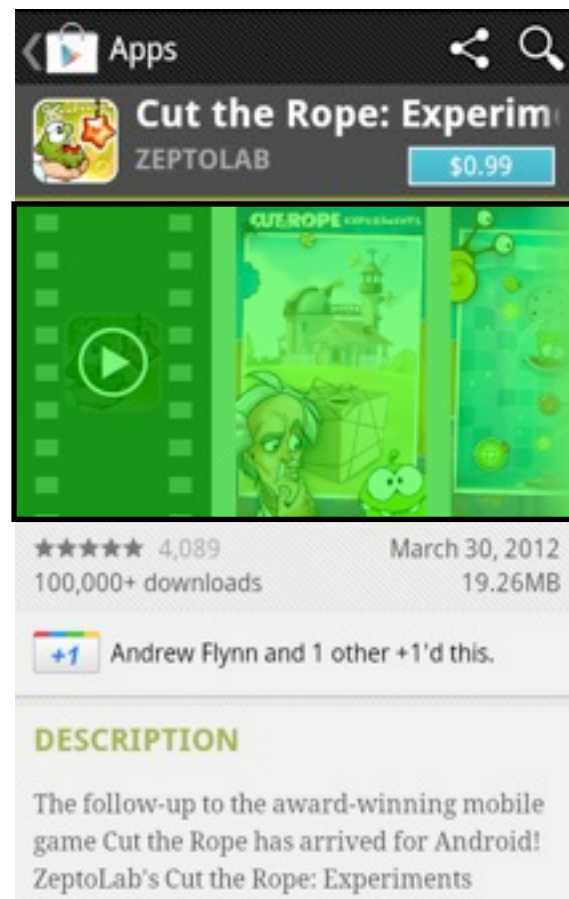
```
public class BylineSection

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
    }
}
```

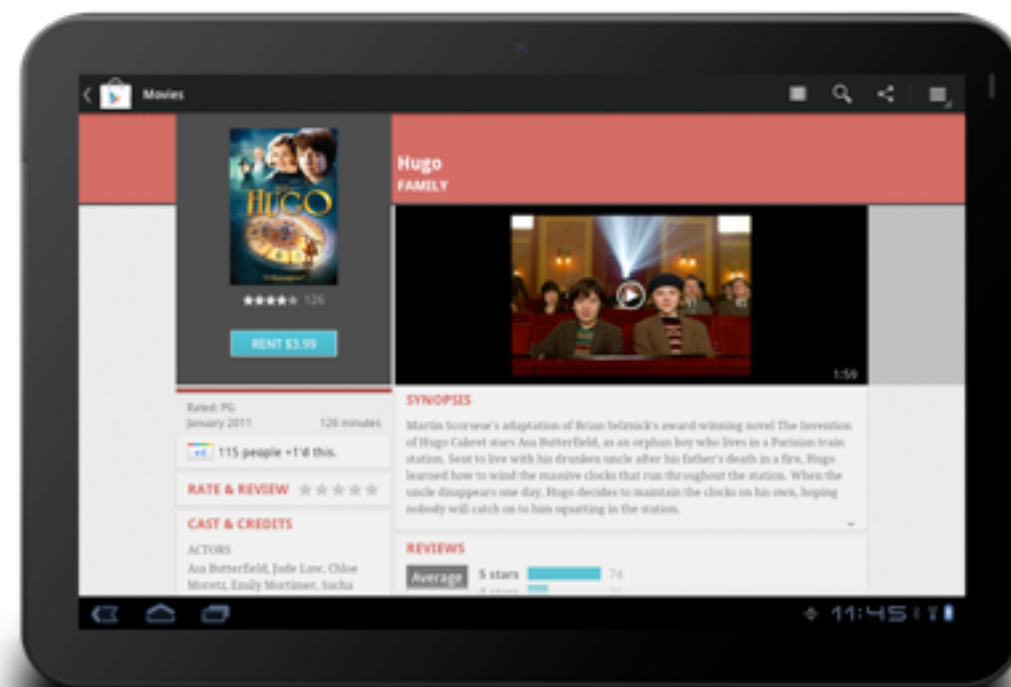
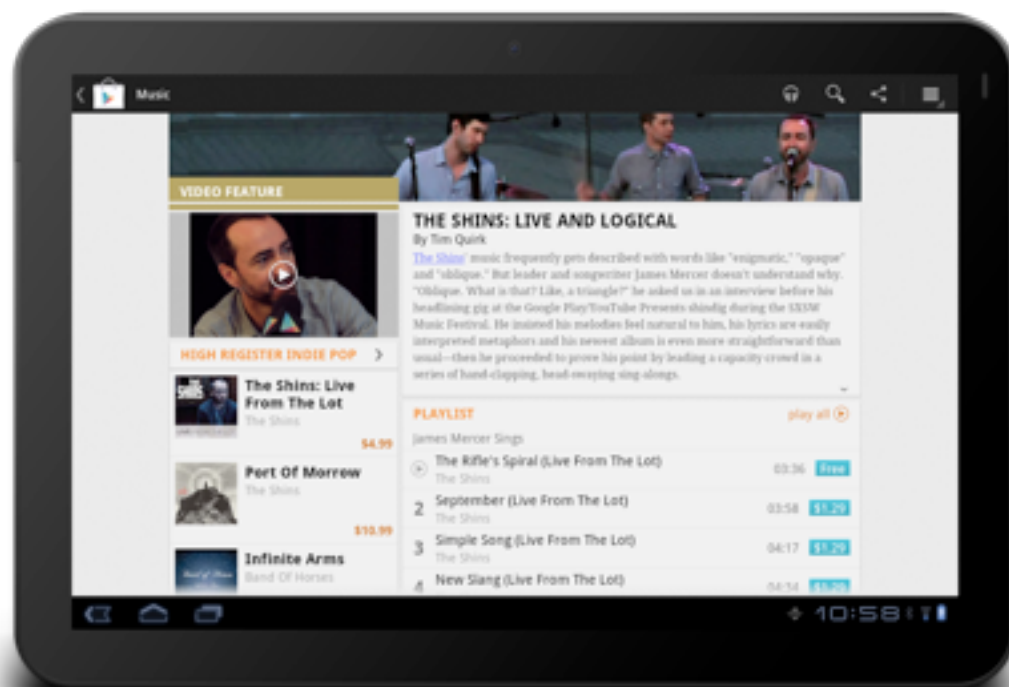
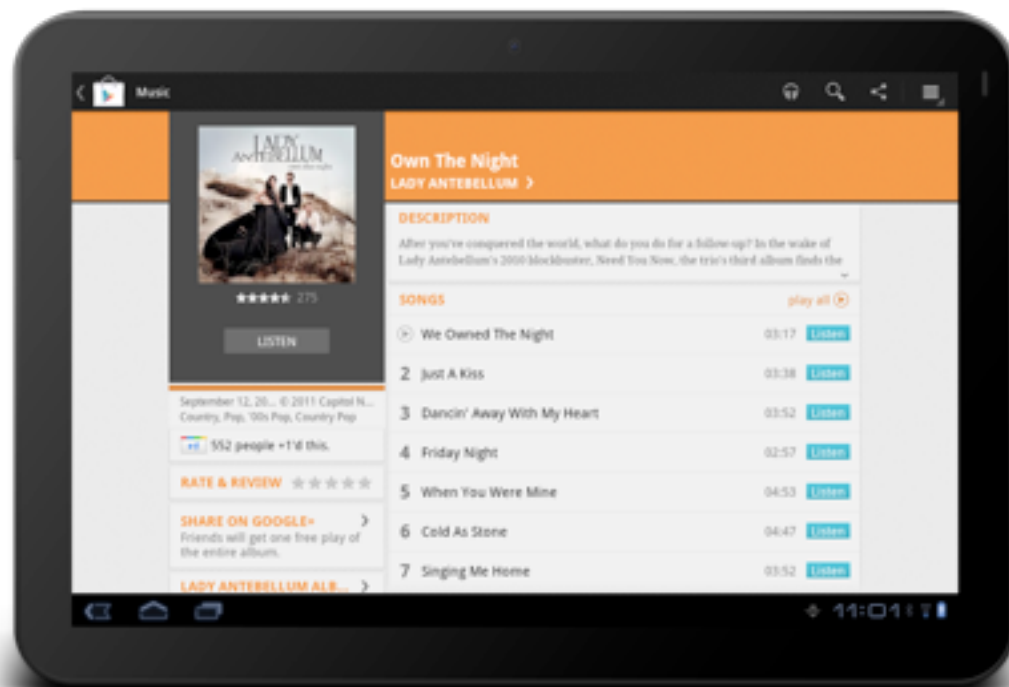

reuse blocks
on the same screen
on different form factors

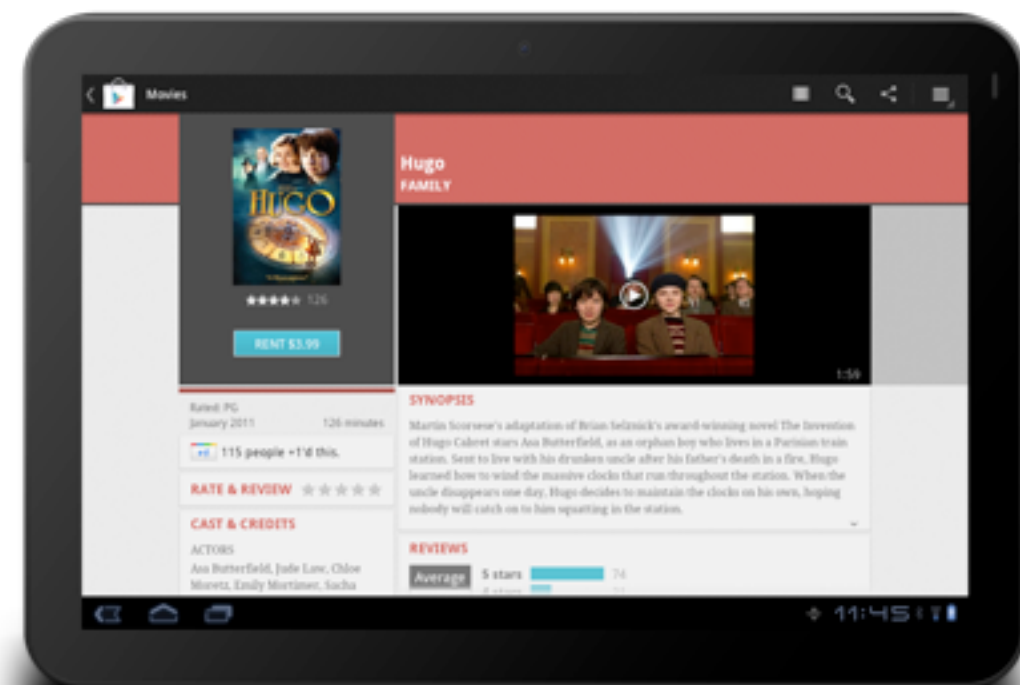
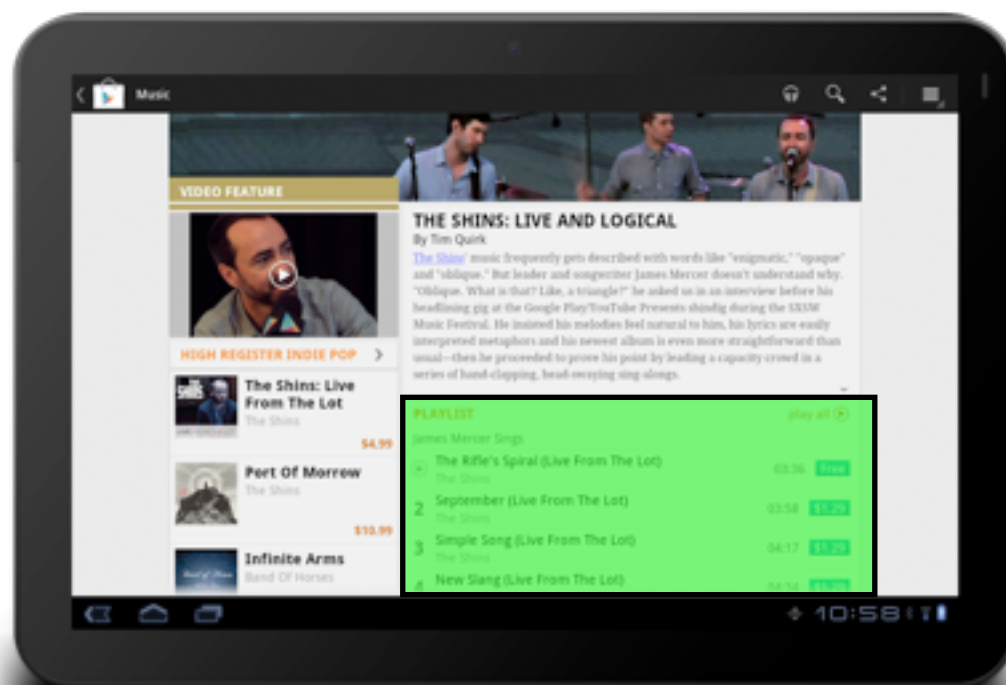
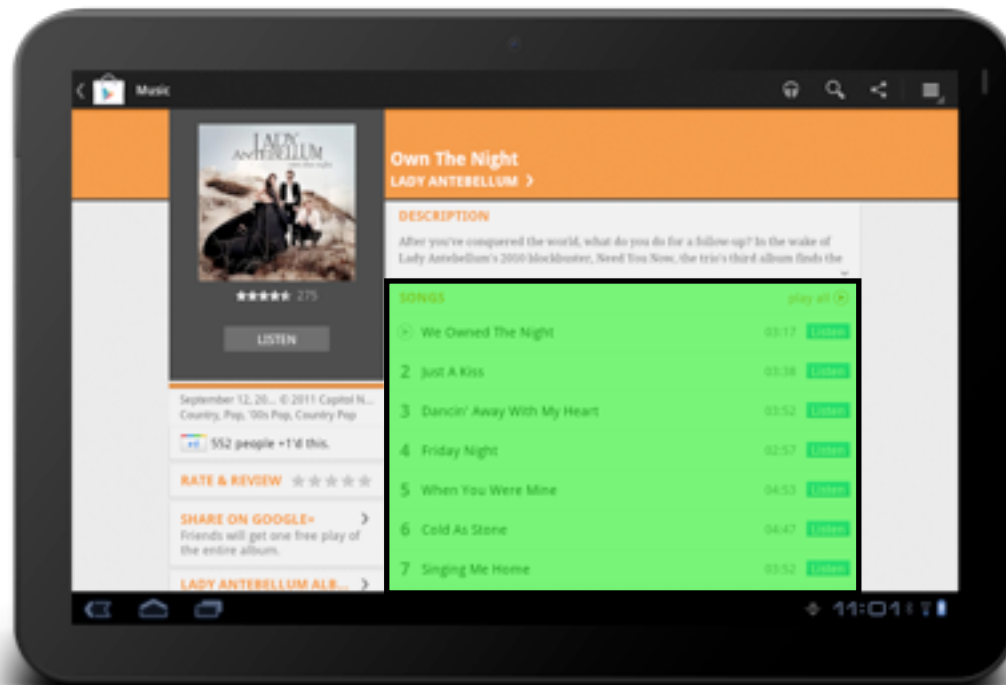


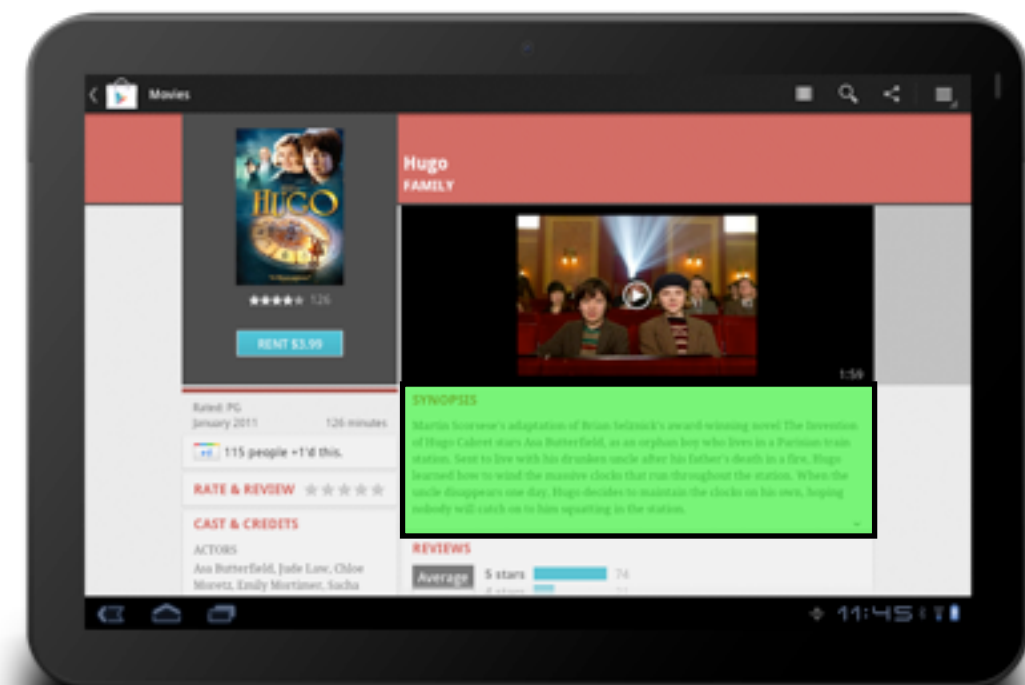
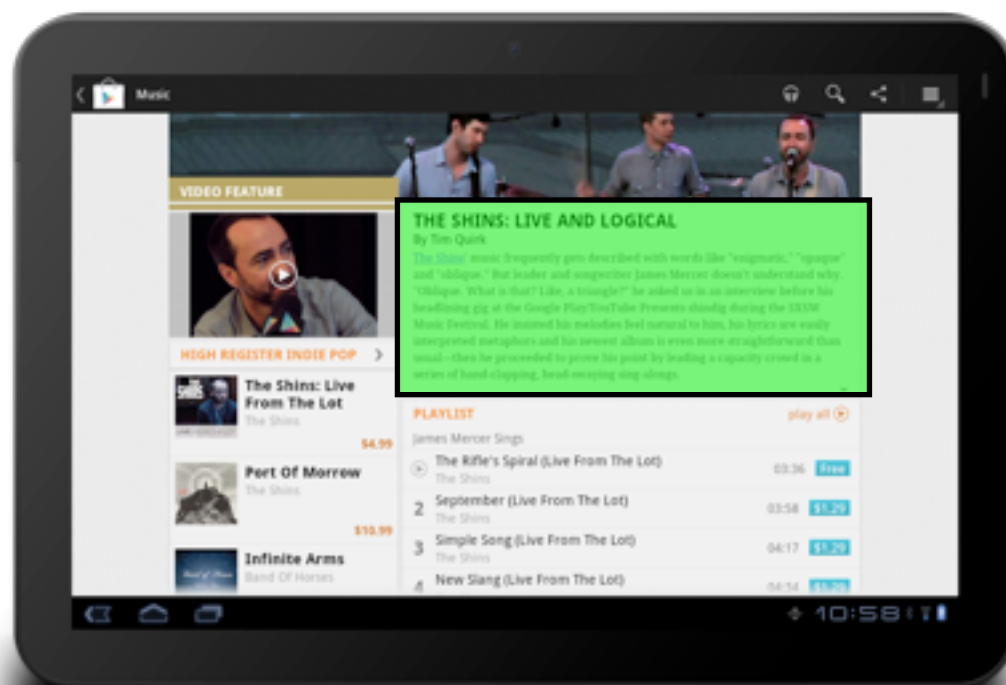
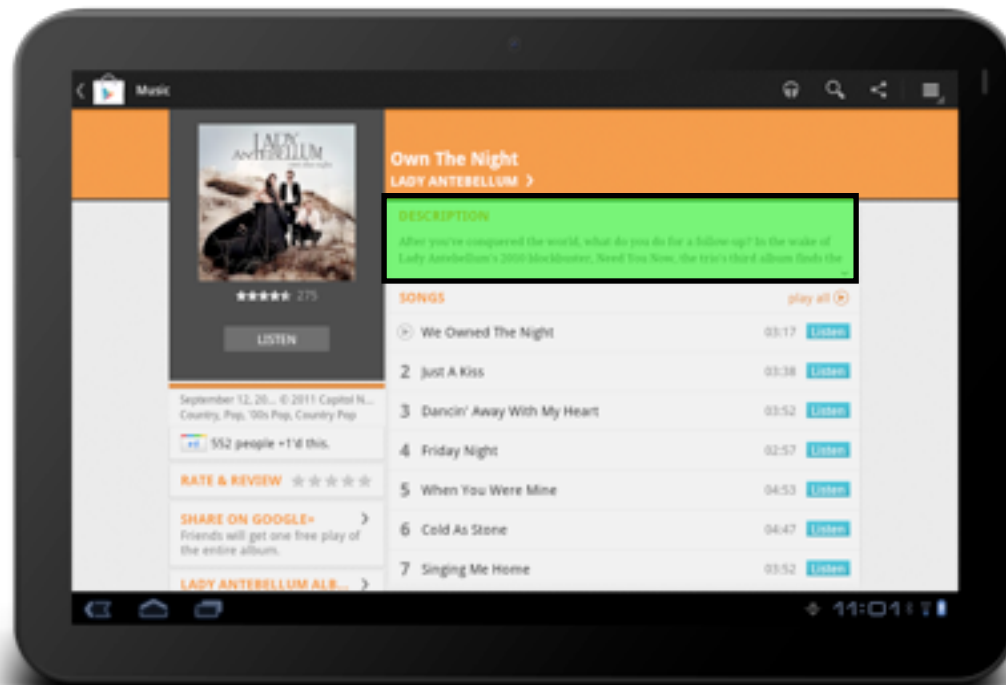
```
<include
    layout="@layout/screenshots_section" />
```

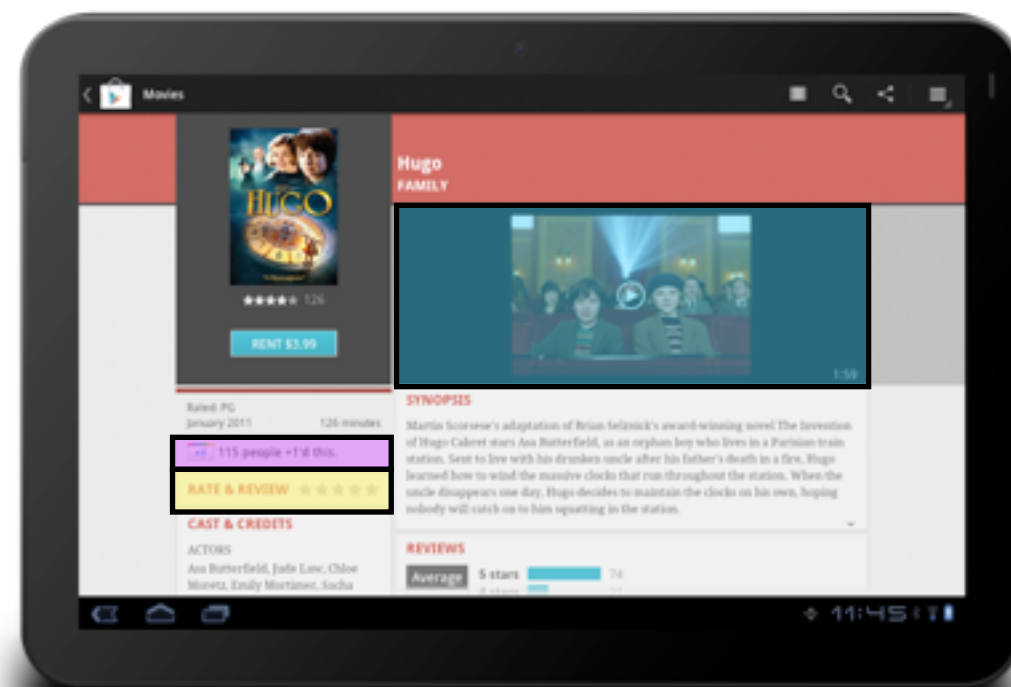
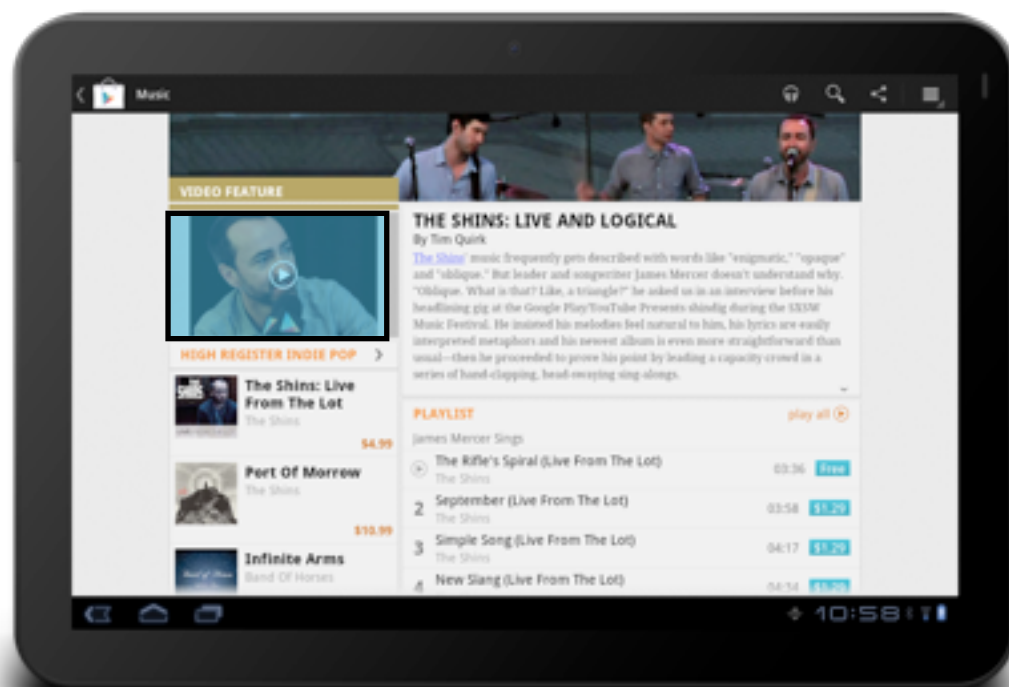
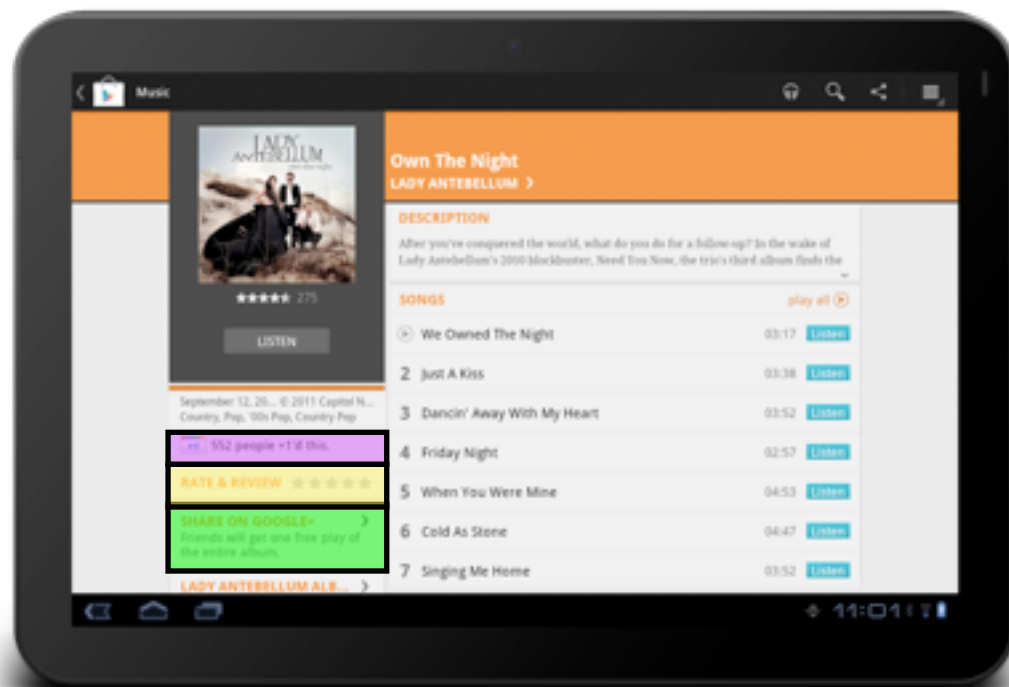
```
ScreenshotsSection trailer =
    (ScreenshotsSection) findViewById
        (R.id.screenshots_section);
trailer.bind(model.getScreenshotsData());
```

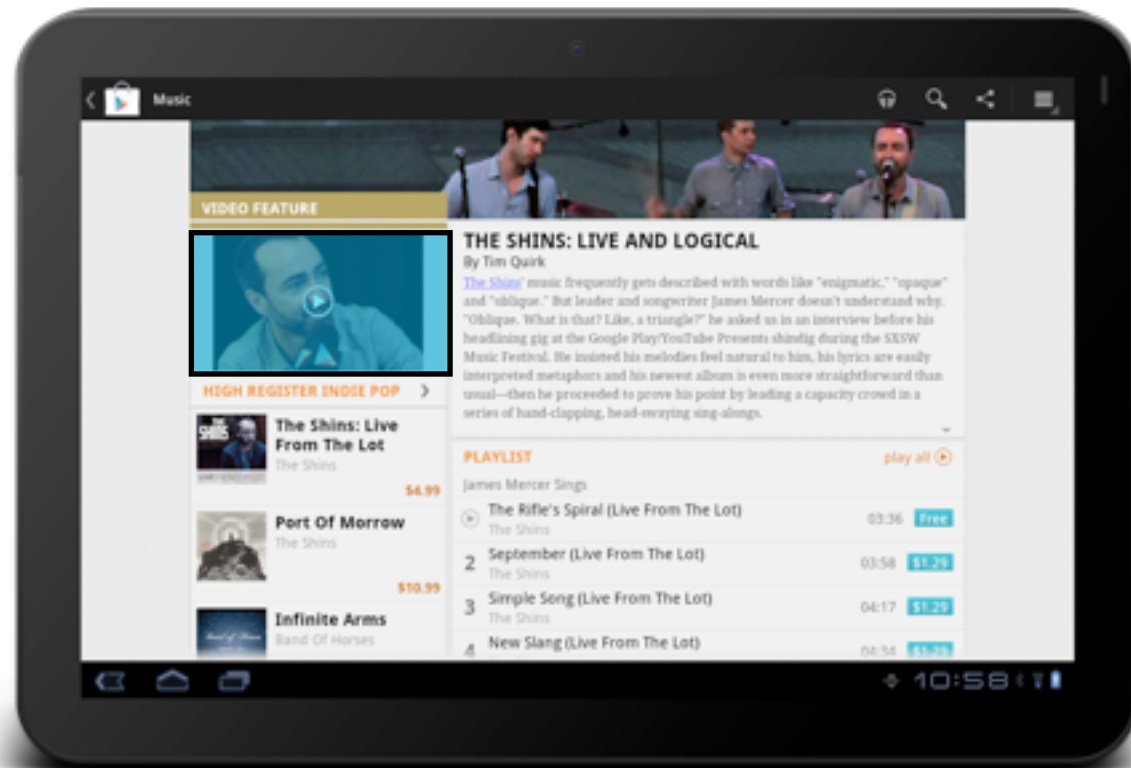
**reuse blocks
in different screens**





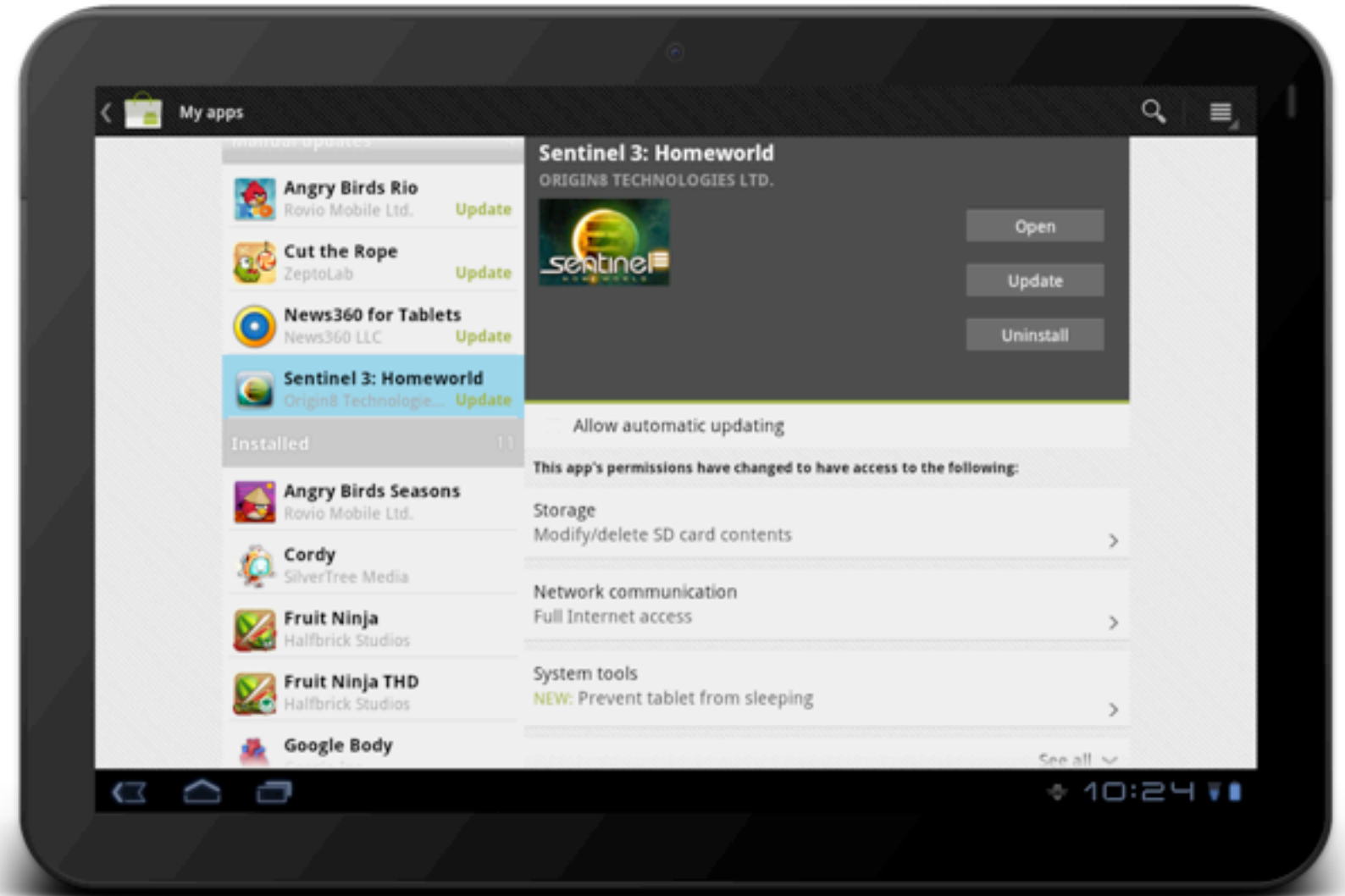
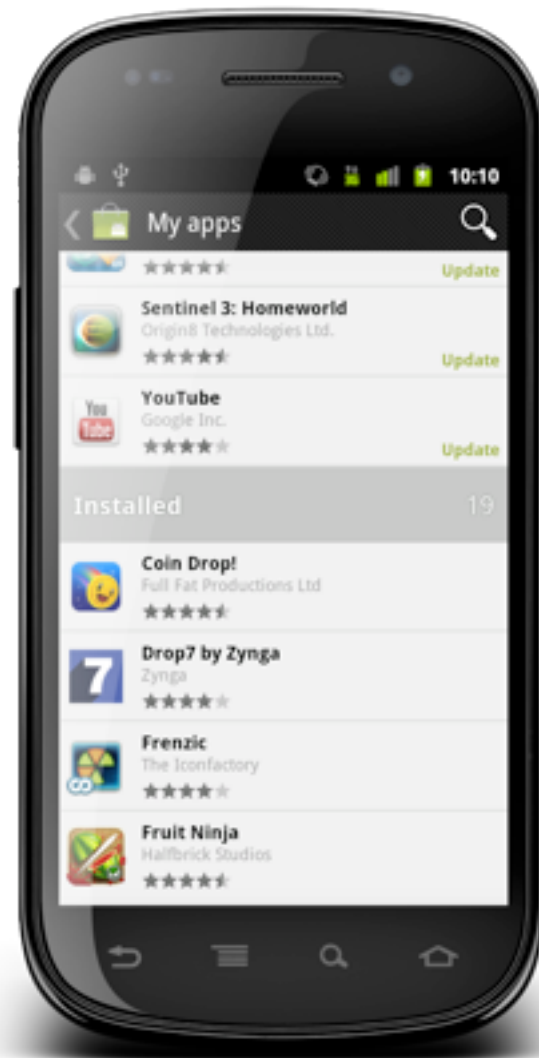




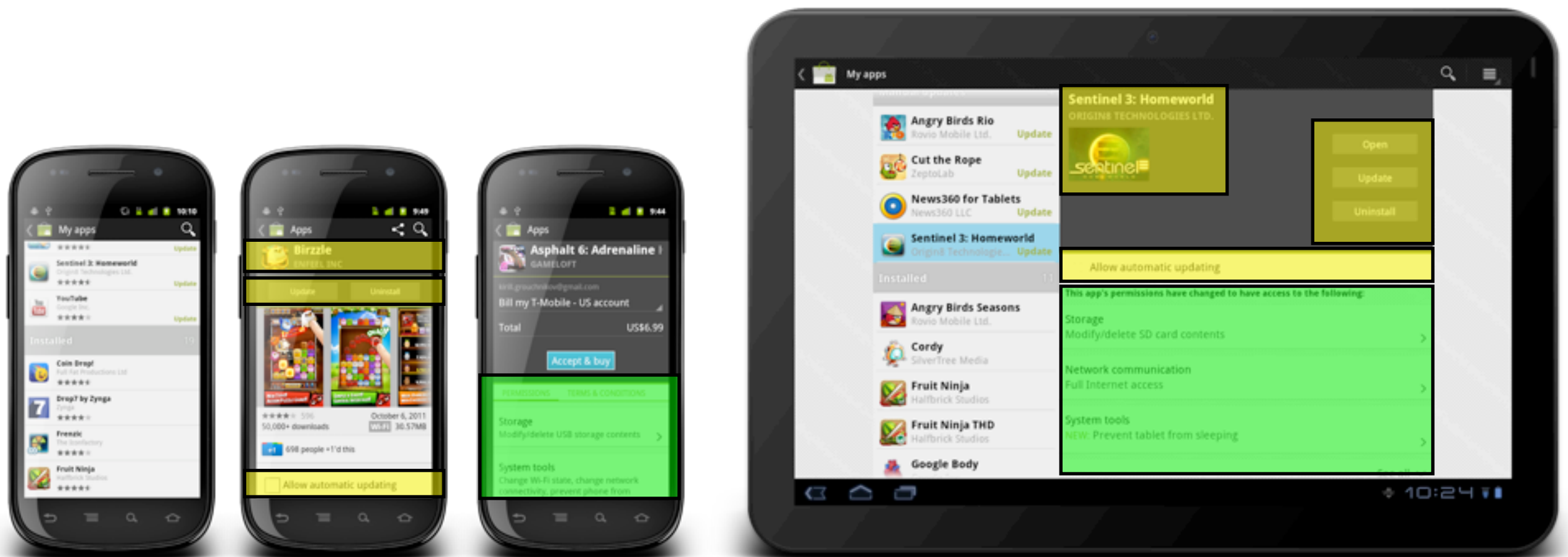


```
<include
    layout="@layout/youtube_trailer_section" />
```

```
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

- slideshare.net/kirillcool
- pushing-pixels.org
- +Kirill Grouchnikov
- kirillcool@yahoo.com