Copyright and Safe Harbor Notice

This presentation may include statements that constitute “forward-looking statements” for purposes of the safe harbor provisions under the Private Securities Litigation Reform Act of 1995, including descriptions of technology and product features that are under development and estimates of future business prospects. Forward-looking statements inherently involve risks and uncertainties that could cause actual results of MicroStrategy Incorporated and its subsidiaries (collectively, the “Company”) to differ materially from the forward-looking statements.

Factors that could contribute to such differences include: the Company’s ability to meet product development goals while aligning costs with anticipated revenues; the Company’s ability to develop, market and deliver on a timely and cost-effective basis new or enhanced offerings that respond to technological change or new customer requirements; the extent and timing of market acceptance of the Company’s new offerings; continued acceptance of the Company’s other products in the marketplace; the timing of significant orders; competitive factors; general economic conditions; and other risks detailed in the Company’s Form 10-K for the year ended December 31, 2016 and other periodic reports filed with the Securities and Exchange Commission. By making these forward-looking statements, the Company undertakes no obligation to update these statements for revisions or changes after the date of this presentation.
Designing for Smartphones
Best practices for design, fit and finish, and ease of use on a small form factor

Tomasz Miekisz - Consultant
Martyna Kotynia - UX Practice Group Leader
Take Advantage of Mobile Design

Mobile: 50.87%
Desktop: 44.78%
Tablet: 4.35%

Desktop vs Mobile vs Tablet Market Share Worldwide - October 2017
Know Your Target Audience and What They Use
Device, resolution, and aspect ratio

<table>
<thead>
<tr>
<th>Device</th>
<th>Resolution</th>
<th>Resolution</th>
<th>Resolution</th>
<th>Resolution</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPhone SE</td>
<td>640 x 1136</td>
<td>320 x 568</td>
<td>iPhone 5</td>
<td>640 x 1136</td>
<td>320 x 568</td>
</tr>
<tr>
<td>iPhone 5, 5C, 5S, iPod Touch 5g</td>
<td>375 x 667</td>
<td>414 x 736</td>
<td>iPhone 6</td>
<td>750 x 1334</td>
<td>375 x 812</td>
</tr>
<tr>
<td>iPhone 6</td>
<td>1242 x 2208</td>
<td>iPhone 6s</td>
<td>iPhone 7</td>
<td>1125 x 2436</td>
<td>iPhone 7 Plus</td>
</tr>
<tr>
<td>iPhone 6s</td>
<td></td>
<td>iPhone 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iPhone 7</td>
<td></td>
<td>iPhone 7 Plus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iPhone 7 Plus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Design Differences

**iPhone**
Info window = custom size

**Android**
Info window = full screen size
## Available Visualizations

<table>
<thead>
<tr>
<th>Category</th>
<th>Feature</th>
<th>iPhone</th>
<th>Android Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualizations</td>
<td>Area Chart</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Bar Chart</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Line Chart</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Pie Chart</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Scatter Chart</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Other Charts</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Widget - Multi Media</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Widget - Marker/Bubble Map</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Widget - Multiple Layers Map</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Widget - Area Map</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Micro Chart</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Calendar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HeatMap</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time Series</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Photo viewer</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Timeline</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Data Cloud</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactive Grid</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>RSS Reader</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Network Visualization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Image Layout</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Native Video Player</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3rd party custom visualization - general</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>3rd party custom visualization - Custom APIs</td>
<td>✔️</td>
<td>❌</td>
</tr>
</tbody>
</table>
Navigation

The most accessible place for navigation is the bottom of the screen

• For big navigation use hamburger menu
• Short menu, sub menu, tabs place on the bottom of the screen

How We Hold Our Gadgets by Josh Clark
Reserve Proper Space for Interactive Elements and Always Consider “Big Finger” Users
Reserve Proper Space for Interactive Elements and Always Consider “Big Finger” Users

Standard UI elements – Human Interface Guidelines

<table>
<thead>
<tr>
<th>UI Elements</th>
<th>iPhone 5 (5.5C, 5S)</th>
<th>iPhone 6</th>
<th>iPhone 6 Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of Status Bar</td>
<td>40 px</td>
<td>40 px</td>
<td>54 px</td>
</tr>
<tr>
<td>Height of Navigation Bar</td>
<td>88 px</td>
<td>88 px</td>
<td>132 px</td>
</tr>
<tr>
<td>Height of Tab Bar</td>
<td>96 px</td>
<td>96 px</td>
<td>146 px</td>
</tr>
</tbody>
</table>

Target sizes

- 72px × 72px (24pt × 24pt @3x)
- 48px × 48px (24pt × 24pt @2x)

Maximum sizes

- 84px × 84px (28pt × 28pt @3x)
- 56px × 56px (28pt × 28pt @2x)
Reserve Proper Space for Interactive Elements and Always Consider “Big Finger” Users

Standard UI elements – Material Design

- MDPI: 160 dpi (1x) 24px
- HDPI: 240 dpi (1.5x) 36px
- XHDPI: 320 dpi (2x) 48px
- XXDPI: 480 dpi (3x) 72px
- XXXDPI: 640 dpi (4x) 96px
Application Flow

Splash screen and application screens
Readability

Increase line spacing
• Use increased line spacing between grid rows,
• bulleted lists, numbered lists, lines and paragraphs to increase readability

Increase font size on mobile
• Always scale font size to the screen size

Choose your font wisely
• When choosing a website font, consider its legibility and readability
• *Italicized text is harder to read*
• DO NOT USE ALL CAPS IN YOUR HEADLINES AND TAGLINES
• It's much harder to read
Always Preview Design on the Target Screen

Marvel App
Creating, editing, playing and sharing Prototype

Create project

<table>
<thead>
<tr>
<th>Your project name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website/TV Any Resolution</td>
</tr>
<tr>
<td>iPhone 8 320x115</td>
</tr>
<tr>
<td>iPhone X 1125x2436</td>
</tr>
<tr>
<td>iPad 1024x1024</td>
</tr>
<tr>
<td>Android 1080x1920</td>
</tr>
<tr>
<td>Apple Watch 102x99</td>
</tr>
</tbody>
</table>

Add a password?

Create Project

Skala Preview
Preview design on device
Clutter

https://libwww.freelibrary.org/explore/topic/cutting-clutter
Optimize Amount of Data to Display per Screen
Optimize Amount of Data to Display per Screen

Visualizations

Reduce number of displayed elements on visualizations

• Around 5 bars for bar graphs
• Limit numbers of grid columns, 2 - 3 portrait, 3 - 5 for landscape
Example of Bad UX

Source: pbs.twimg.com/
Eliminate Clutter

Take up space but don’t increase understanding
Eliminate Clutter

Remove borders and gridlines
Eliminate Clutter

Remove marks
Eliminate Clutter

Adjust labels
Optimize Amount of Data to Display per Screen

Numbers

Abbreviate numbers

• B for billion
• M for million
• K for thousand
Eliminate Clutter
Icons

Must be functional
Icons must visually describe their function and purpose. Make them simple, familiar and meaningful

Picture superiority effect

<table>
<thead>
<tr>
<th></th>
<th>Text</th>
<th>Text + Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td></td>
<td>65%</td>
</tr>
</tbody>
</table>

It is not a decoration
Icons should only be used when necessary. Avoid overusing them and do not use them simply for decoration

Distortions
Always display images at their intended aspect ratio to avoid distortion
Optimize Amount of Data to Display per Screen
Converting existing Web, iPad project into iPhone

Slice and dice data

• Break a body of information down into smaller parts so you can display it on the smartphone screen
Memory

- Sensory memory
- Short-term memory
- Long-term memory
Focus Your Audience’s Attention

How many 3’s do you see?
Focus Your Audience’s Attention

How many 3’s do you see?
Use Contrast to Indicate Importance

Use contrast to indicate importance

• Color
• Size
• Shape
Focus Your Audience’s Attention

Preattentive attributes
Focus Your Audience’sAttention

1 → 2
3 ← 4
Focus on Content

• Put key information first

• Users start at the top left and the first 2-3 words are scanned the most

• F shape pattern
Example of Bad UX

Source: Jeff Wysaski
Example of Bad UX

Source: Jeff Wysaski
Ensure that Primary Content is Clear at its Default Size
Be Consistent Across all Applications

Consistent placement of key elements

• Navigation
• Titles
• Headers
Always Align Content

- Attributes and attribute’s header - left
- Metrics and metric’s header - right
Example of Bad UX

Source: 25.media.tumblr.com/
Take Advantage of Both Portrait and Landscape Mode

![Diagram showing sales data and category sales](image-url)
Color

Limit colors

2-3 colors

60-30-10 rule for success

<table>
<thead>
<tr>
<th></th>
<th>60%</th>
<th>10%</th>
<th>30%</th>
</tr>
</thead>
</table>

Consider colorblindness

- Non color blind
- Protanope
- Deuteranope
- Tritanope

Useful tools

Adobe Color CC
Thank You!