

Smart TVs

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What is Smart TV

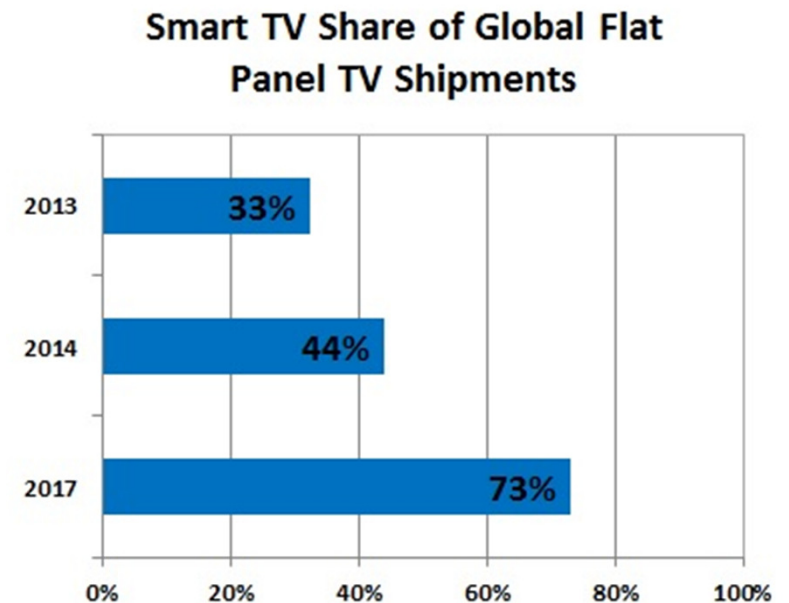
- A TV device (or set-top-box/media player) that enables the delivery of Internet-based services and content
- Local devices and content can be also connected and accessed
 - DLNA, UPnP, Network-attached Storage
- A combination of a TV device and a computer
 - ... and a metaphor of smart phones to TV
- It executes an operating system and runs Smart TV apps
- Apps can be developed with SDKs (Software Development Kits), proprietary or open
- Various business models are supported

Smart TV services and content

- TV channels
- Video on demand
- Social networking applications
- EPGs
- Games
- Interactive advertising
- Browsing Web content
- Browsing “local” multimedia
- ...

Smart TV market

- 78 Million **Smart TVs** Shipped in 2013 (55% increase from 2012)
- ~ 50% of Smart TV owners across the USA and major European markets are currently using their TV's Internet capabilities
- 1 Billion **connected TV devices**
 - Smart TVs, Set-top-boxes (e.g., Apple TV, Android TV), game consoles
 - The market is predicted to double in size between now and 2018, reaching the 2 billion mark, with smart TVs carrying embedded platforms as the main segment to watch



The evolution of Smart TV

- The Past
 - “Individual” attempts from TV vendors
- The Present
 - Highly fragmented market: many vendors, many platforms, frequent changes
 - Some synergies emerge
- The Future
 - The fail of 3DTV attempts gives Smart TV more place to grow.
 - Higher resolution and built-in features will be the target in the next years
 - Premium TV subscriptions fall and streaming video services rise

Key Smart TV vendors

- Samsung
- LG Electronics
- Panasonic
- Sony
- Google
- TPVision
- Toshiba
- ...

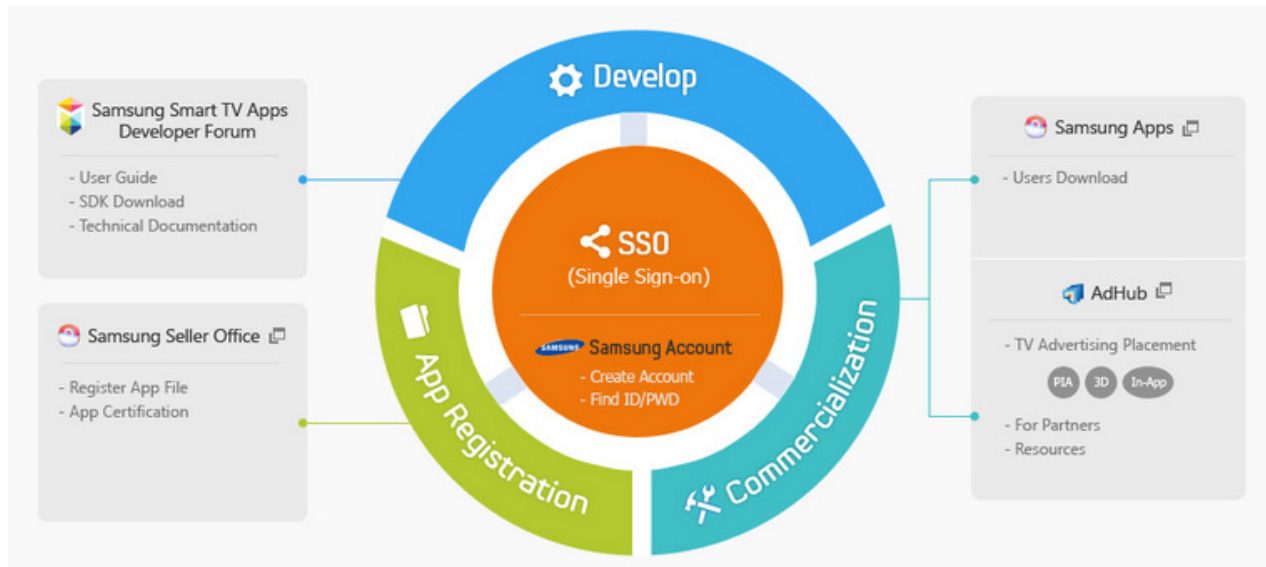
Smart TV platforms

- Android TV (Google, Sony, ...)
- Mediaroom (Microsoft)
- Yahoo! Connected TV
- Samsung Smart TV (new Tizen-based available)
- Smart TV Alliance (STA)
- Kodi Entertainment Center (formerly XBMC Media Center)
- ...

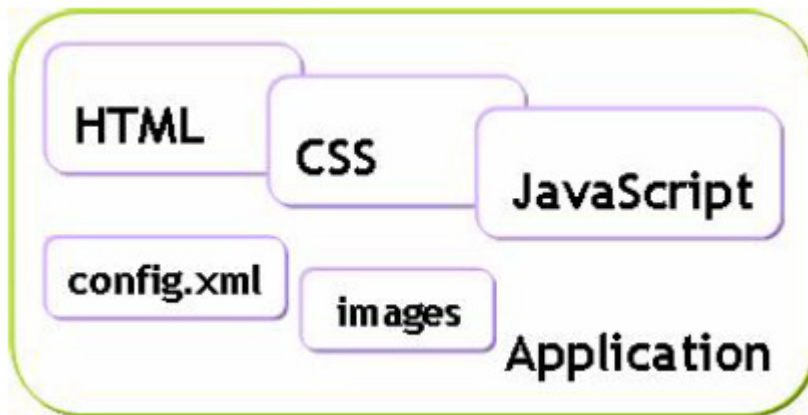
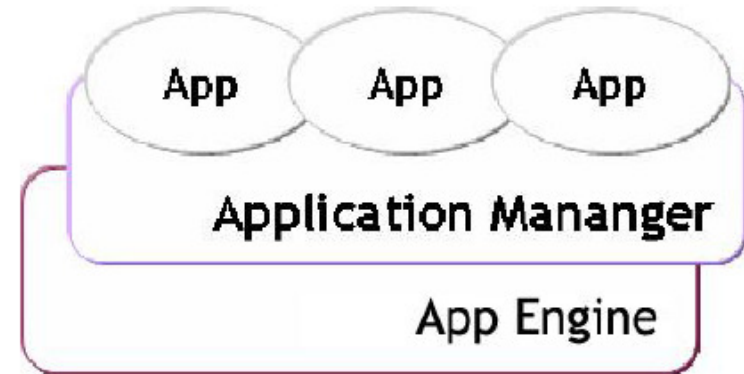
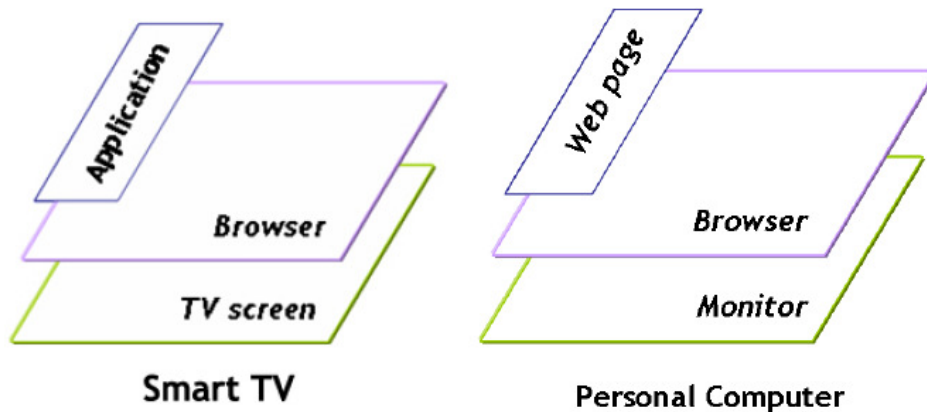
The Smart TV Alliance (STA)

- Founded in 2012 by LG Electronics, Toshiba, TPVision (Phillips), Panasonic
- A new industry standard to allow for:
 - Unified contract procedures between app developers and manufacturers
 - Single SDK with IDE and Emulator
 - Free to download
 - “Build once, publish everywhere”
- (Common) Developer Portal opened at 1/3/2014




Samsung Smart TV App Development



Smart TV app lifecycle



App types

Display type	Description	Screen layout
Full-screen application	Fills the entire screen with an application.	
Single-wide application	Makes an application displayed only on part of the screen.	
Ticker	Keeps an application on the screen while you do other things with your TV.	

Source: Samsung

Main app file structure

- Application manager: authenticate, install, delete, update, open, finish applications
- Index.html: the initial access point for the app
- Config.xml: a mandatory file with settings (p.23 Developer Guide)



Source: Samsung

Sample index.html

```
<!DOCTYPE html>

<html>
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
  <title>Hello World!!</title>
  <script type="text/javascript" language="javascript"
src="$MANAGER_WIDGET/Common/API/Widget.js"></script>
  <script type="text/javascript" language="javascript"
src="$MANAGER_WIDGET/Common/API/TVKeyValue.js"></script>
  <script type="text/javascript" language="javascript" src="JavaScript/Main.js"></script>

  <link rel='stylesheet' type='text/css' href = 'CSS/Main.css'/>
</head>

<body onload="Main.onLoad();">
  <div id='welcome'>Welcome to Samsung widget world!</div>
  <a href='javascript:void(0);' id='anchor' onkeydown='Main.keyDown();'></a>
</body>
</html>
```

Source: Samsung

Sample Main.js

```
var Main = {                                     // Main object
}

var widgetAPI = new Common.API.Widget();        // Create Common module
var tvKey = new Common.API.TVKeyValue();

Main.onLoad = function(){                       // called by <body>'s onload event
    alert("Main.onLoad()");
    widgetAPI.sendReadyEvent();                // Send ready message to Application Manager
    document.getElementById("anchor").focus(); // Focus to Anchor for handling key inputs
                                                // from remote controller

    /**
     * JavaScript code Here!
     */
}

Main.keyDown = function(){                      // Key handler
    var keyCode = event.keyCode;
    alert("Main Key code : " + keyCode);

    switch (keyCode) {
        case tvKey.KEY_LEFT:
            alert("left");
            document.getElementById("welcome").innerHTML = "Nice to meet you.";
            /**
             * Code for Left key event!
             */
            break;
        case tvKey.KEY_RIGHT:
            alert("right");
            document.getElementById("welcome").innerHTML = "I'm so happy.";
```

Source: Samsung

Main.css

```
body {  
    margin: 0;  
    padding: 0;  
    background-color: transparent;  
}  
  
#welcome {  
    position: absolute;  
    left: 50px;  
    top: 50px;  
    width: 500px;  
    height: 50px;  
  
    background-color: #AFAFAF;  
    color: #99FFFF;  
    font-size: 30px;  
    text-align: center;  
}
```

The result



Source: Samsung

UX issues

- 1. The average distance between a TV and its viewers is 3 meters (10ft).
- 2. The standard Remote is the fundamental TV control.
- 3. TV is used by more than one person.
- Special attention to:
 - Focus in visual elements
 - Navigation sequence
 - Not many screen transitions

Business models

- Hardware selling
- App revenue models
- Advertising
- ...

STA revenue sharing model

PAYMENT TYPE	In-App Payments for Content	In-App Payments for Subscriptions	In-App Payments for Goods/Services	Rate-card Payments by Advertisers
APP CATEGORY	tVoD / transactional Content (non-Adult)	sVoD / subscribed Content (non-Adult)	E-commerce / Physical Goods/Services	aVoD / ad sponsored content
BUSINESS MODEL	Revenue share per content item sold	Revenue share on the monthly subscription fee, for the lifetime of the subscription. Applicable for new subscriptions registered via STA	Revenue share per item sold	Revenue share on the advertizing turnover within the App
PROPOSED SPLIT	10% to STA	10% to STA	8% to STA	15% to STA

Samsung Smart TV revenue models

- PIA - Premium Interactive Advertising
- In-app - available on thousands of TV applications
- 3D - World's First 3d advertising
- In-App Purchase
 - 70% Seller -30% Samsung