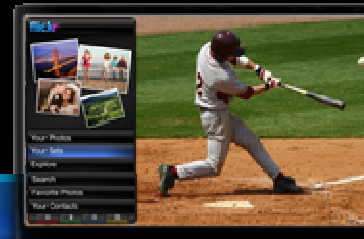




Future of Television

Sweeping Change at Breakneck Speed



Cisco Internet Business Solutions Group (IBSG)

March 2011

Background & Approach

Goal: Predict the Future of TV in 5, 10, 15, 20 Years

BACKGROUND

Change is happening at breakneck speed, driven by:

- Technology
- Consumer behavior
- Business-model disruptions

How will the industry evolve?

APPROACH

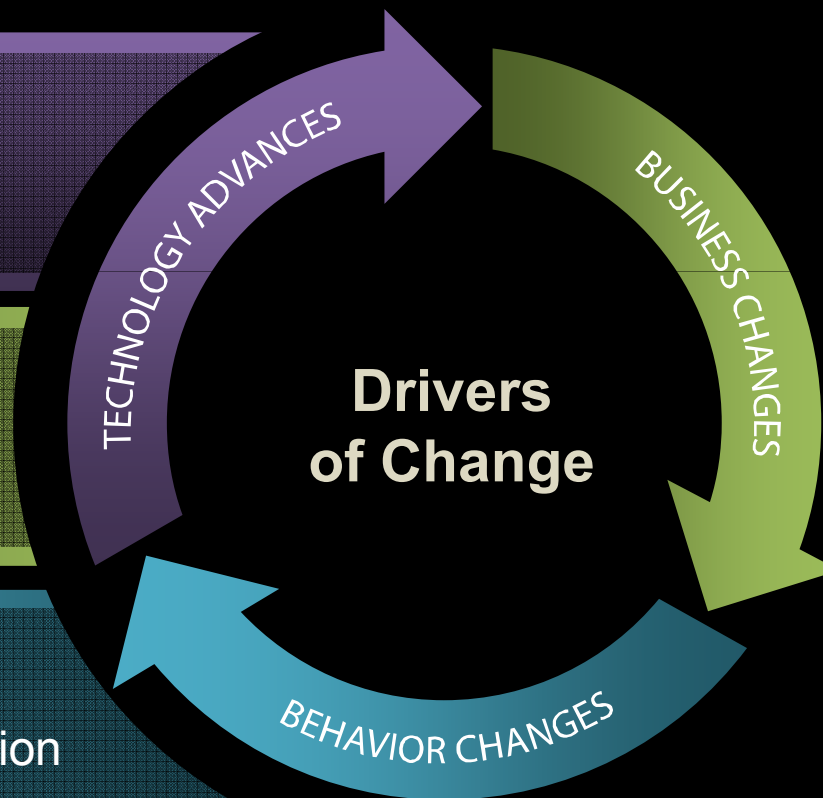
1. Interviewed 50+ industry executives
2. Synthesized interview findings
3. Validated predictions through survey of interviewees
4. Described results in white paper; developing prototype

Source: Cisco IBSG, 2011

The Future of TV Is Already Upon Us

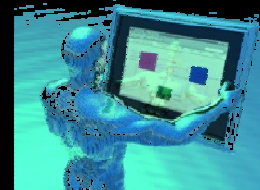
Three Key Drivers Will Permanently Alter the Entertainment Landscape

- Ubiquitous broadband
- Advances in screens, interfaces, and AI
- Content explosion
- Business-model pressure
- Time-shifting
- On-the-go content consumption



Source: Cisco IBSG, 2011

Technology Drivers Accelerate Pace of Disruption in Delivery of TV Experience



Cloud Computing

- Centralized resources enable efficient, **flexible computing**
- **Ubiquitous networks** make power of Internet available all over the world

nScreen Delivery

- **Content management** enables efficient video delivery in appropriate formats
- **Streaming trick plays:** time shifting, pause/resume, session shifting

Content Engineering

- **Computer-generated imaging** enables enriched visual production
- **Artificial intelligence** enables storytelling automation via profiling of likely responses and probable actions

New Devices

- **Capture:** higher-quality personal video, bigger angles, and 3D for professionals
- **Display:** high-def in smaller forms, 2D moving to 3D, holograms on horizon

Source: Cisco IBSG, 2011

Shifting Business Models Will Directly Influence Consumer Behavior

TV's Traditional Business Models Are Under Pressure

Disruption in Value Chain
+
Efforts To Optimize
Existing Revenue Streams

Are
Driving

Business-Model
Experimentation

- Traditional players move into new positions in value chain
- Content owners pursue diverse monetization opportunities and seek to lower costs
- Content availability on Internet changing fast
- Internet-based business models still unproven:
 - Advertising
 - Subscription
 - Transaction
- New release windows

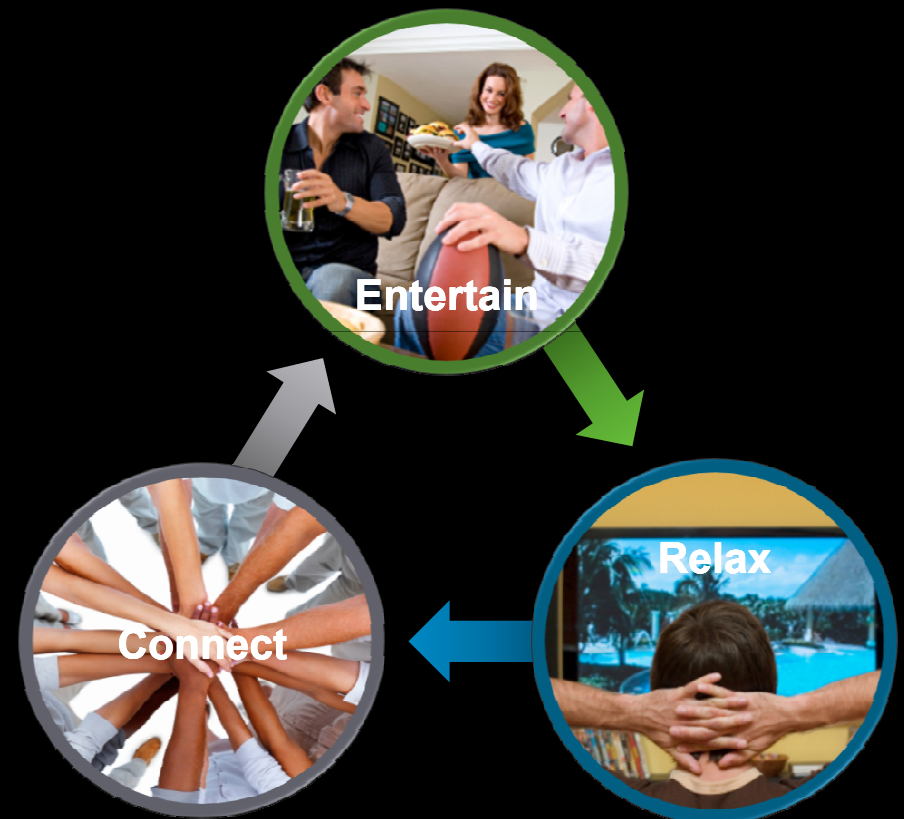
Source: Cisco IBSG, 2011

TV's Core Benefits May Be Fixed, but Consumer Behavior Constantly Evolves

TV's Core Benefits Remain, but How Consumers Define Them Will Change

Consumers' definition of what is entertaining and relaxing, and how to connect, will change over time

- In reaction to new technology and business models
- In keeping with larger demographic trends
- In pursuit of experiences that are easier, cheaper, or better



TV's Core Consumer Benefits

Source: Cisco IBSG, 2011

Coming Soon to a TV Near You: Television Experience Transformation

And There Are Opportunities for Industry Players Today



Source: Cisco IBSG, 2011

Channels Go Away

We'll Watch Personal TV Streams, or Access Content Through Search



- On-demand, personalized, but branded content (Pandora-like TV)
- Recommendations based on past behaviors and social networks
- Combined on-demand / real-time, UGC / professional, OTT / walled garden

Faster
(61%)

By
2030
(32%)

Slower
(6%)

100%
Experts
Agree

Today

Future

- DVRs mainstream
- Netflix UI

Recommendation engine

UI incorporates friends' favorites

Integrated media interface

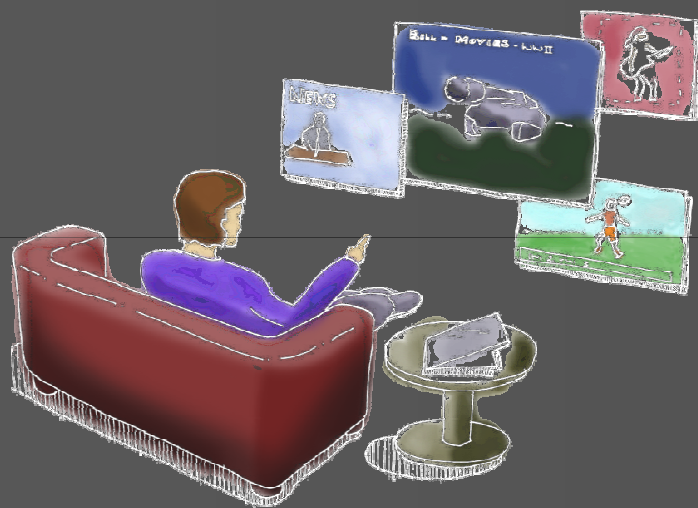
Personalized linear TV

"Mood TV"

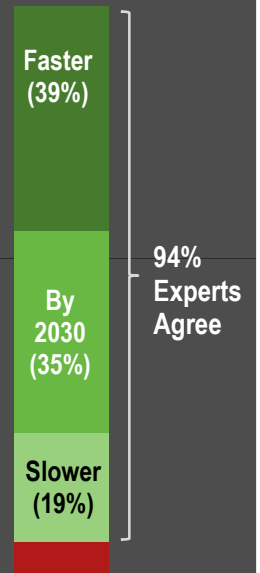
Source: Cisco IBSG, 2011

Kiss the Remote Goodbye

Words, Gestures, and Gadgets Will Control TV of the Future



- Smartphones, tablets replace remote controls
- Viewers use speech, gestures, eye movements to navigate content
- TV follows you from room to room and screen to screen



Today

Future

- Free TV control apps for mobile
- Kinect, Wii interfaces

Gesture-sensing interface

Voice controls

Remotes stop shipping with TVs

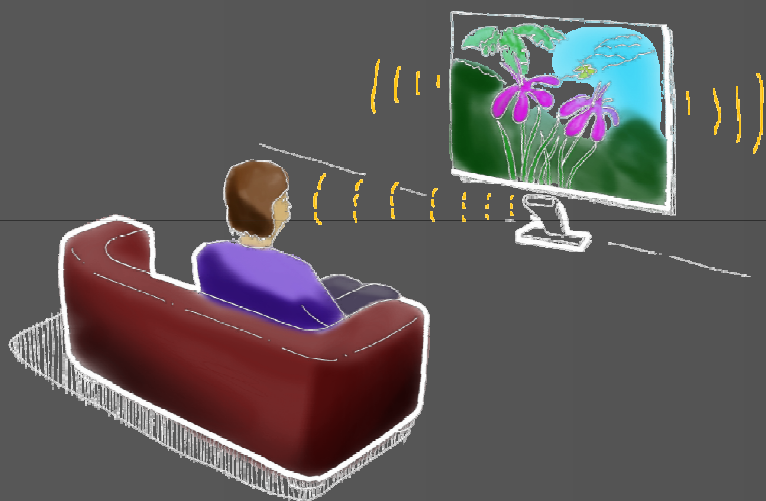
Eye-tracking technology

Mind interface

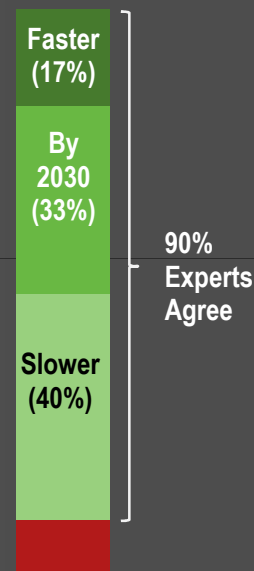
Source: Cisco IBSG, 2011

Is It Real, or Is It Television?

Tech Advances Will Bring New Sensory Elements to Programs



- Viewers not only watch shows, but smell, feel, and taste them, too
- More lifelike program images (“Super HD,” life-size holograms)
- Viewers choose their perspective (via 360-degree camera angles)



Today

- 3D
- Sensory feedback in games

3D without glasses

8K displays

360-degree camera angles

Smell reproduction

Life-size, full-motion holograms

Future

Source: Cisco IBSG, 2011

TVs Give Way to Screens Anywhere

Before Long, We'll Watch on Any Flat Surface



- Everyday objects double as viewing screens
- Content can be resized and placed anywhere (bathroom mirror, living-room wall)
- Integrated entertainment, home monitoring/control, email, social media

Faster
(30%)

By
2030
(30%)

Slower
(40%)

100%
Experts
Agree

Today

Future

- IP-connected TVs
- TV on PCs, smartphones

Embedded screens
(e.g., walls,
paintings)

Pinch & pull
to size

Flexible screen
shapes & materials

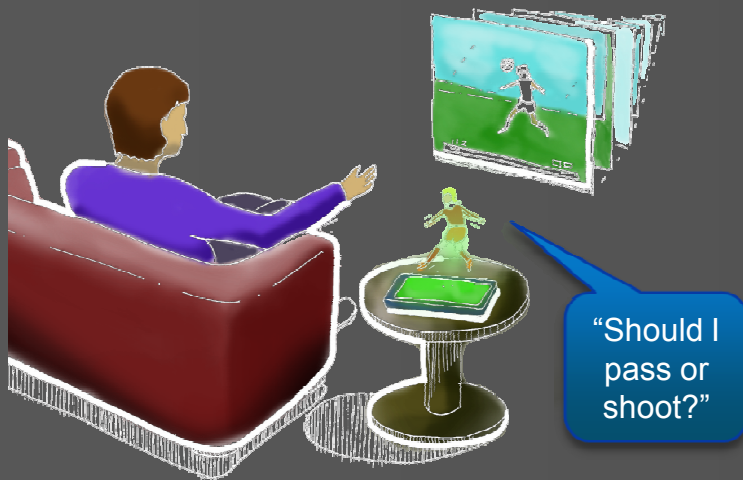
Bidirectional
screens

Holograms

Source: Cisco IBSG, 2011

Don't Just Watch, Get Involved

Characters Will Step Off the Screen into Viewers' Lives



- Fan involvement grows from simple to immersive
- Viewers shown additional scenes based on profile, preferences
- Characters engage with fans outside of the storyline

Faster
(39%)

By
2030
(32%)

Slower
(16%)

87%
Experts
Agree

Today

- TV linked to social network fan groups
- Fan "rewards" built into participation

Personalized viewing based on parental controls

Consumer involvement impacts plots

Interact with characters in Second Life

TV "friends" involved in your life through AI, AR

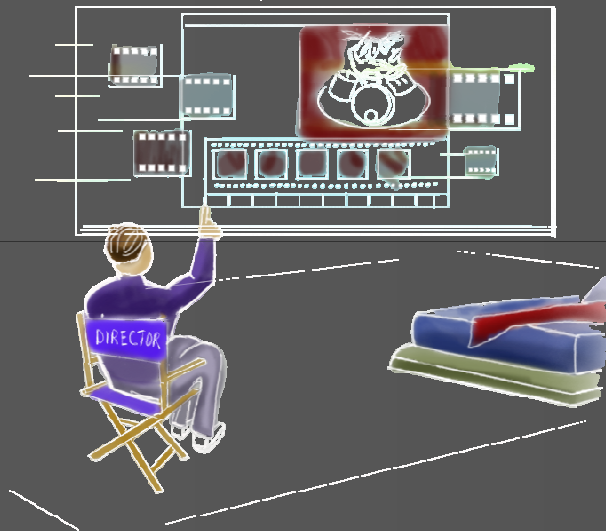
TV "friends" are lifelike

Future

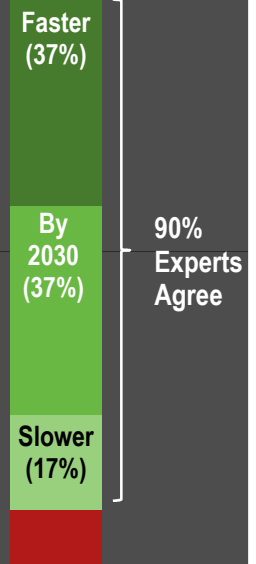
Source: Cisco IBSG, 2011

“Regular Joes” Go Hollywood

TV Content from Aspiring Semi-Professionals & Amateurs Will Compete with Hollywood Fare



- New methods to create, fund, and deliver content to the mass market are democratized
- Semi-professionals and amateurs use low-cost, high-end production tools
- Online agents mine and edit UGC to create quality long-form content



Today

- YouTube phenomenon
- Independent low-budget productions go mainstream

Free library of video scenes for any use

Collaborative funding models

High-quality local content sits next to Hollywood shows

Programmatic storytelling based on personal input

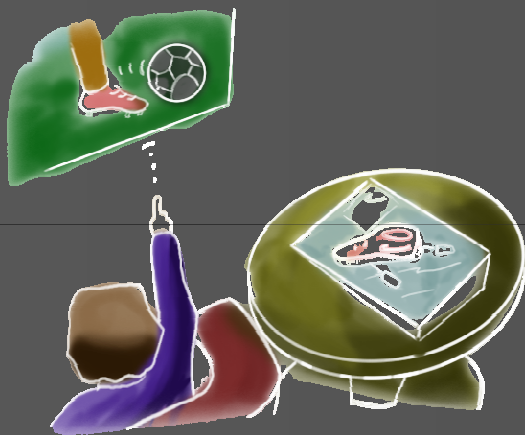
Using AI, filmmakers no longer need to shoot new scenes to create films

Source: Cisco IBSG, 2011

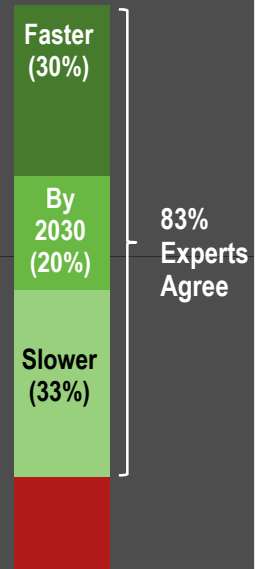
Future

Ads Get Personal

Contextual, Highly Interactive, and Laser-Targeted



- 30-second spot replaced by dynamic, personalized product placement
- Placement based on individual preferences & behaviors
- Zero-in for more information; push product details to nearby tablets or smartphones



Today

- Goggle Adwords—targeted ads on search
- Some interactivity (BBC red button)

“High-resolution,” location-specific ads and promotions

Telescoping ads

Individually targeted advertising

Dynamic product placement

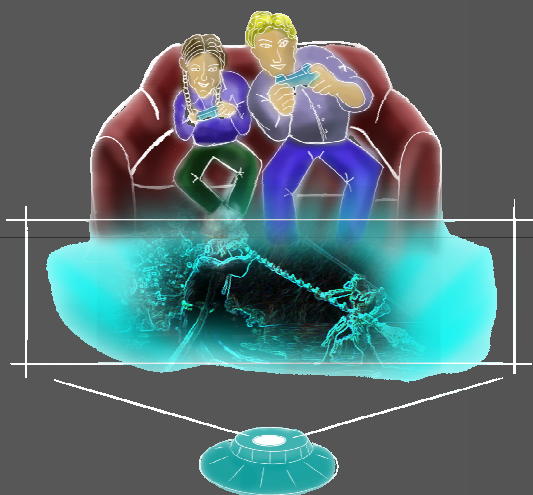
Facial recognition feedback tracks viewer reaction to ad

Future

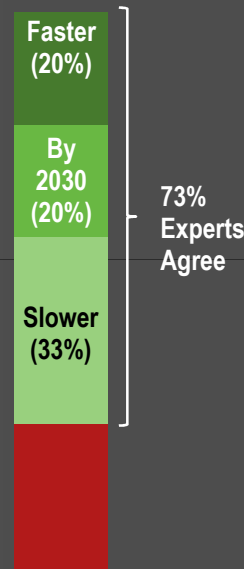
Source: Cisco IBSG, 2011

Creation Goes Viral

Crowdsourcing and Game Capture Will Be Used To Create New Storylines



- Social networks enable fans to participate in plot development
- CGI makes games lifelike, and “machinima” emerges as mainstream entertainment
- Consumers allow their everyday lives to be used in character development



Today

- Machinima via YouTube
- Crowdsourcing Second Life structures

In Facebook, fans easily participate in plot development

Movies use machinima for special effects

Tools mine social networks for characters and storylines

Agents monitor game play and capture compelling machinima

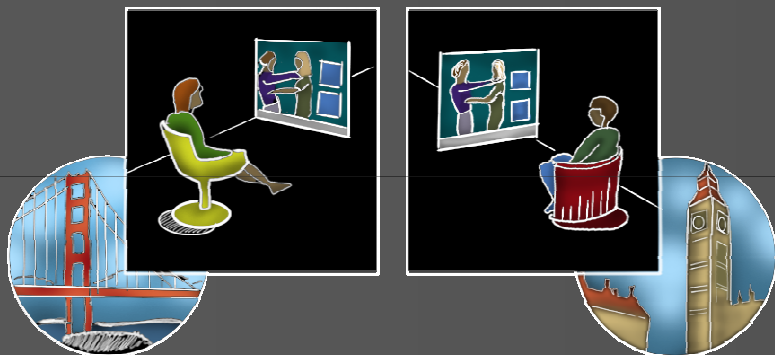
Life recorders capture consumers' everyday lives

Future

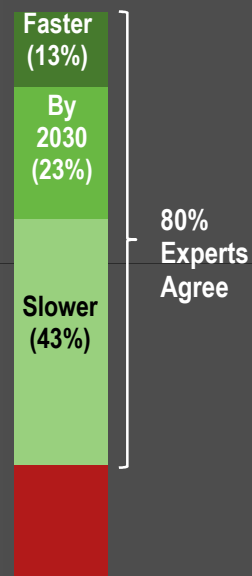
Source: Cisco IBSG, 2011

Watch Together, Virtually

TV Will Help You Engage with Remote Friends and Family from Your Living Room and Beyond



- Viewers use TV buddy list to invite remote friends to watch TV with them
- HD screens and audio are dynamically customized to convey individuals' in-room virtual presence
- Synthesized feedback from social networks and communities of interest



Today

- Consumer telepresence
- Facebook TV widgets

TV buddy list

Integrate telepresence or behavioral cues with TV

360-degree dynamically split telepresence

Virtual viewing venues at home or in Second Life

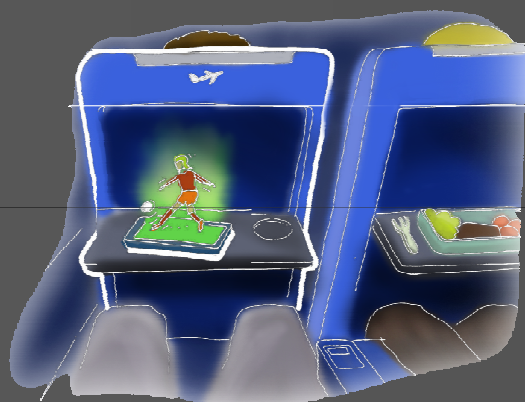
Holographic friends/avatars on sofa

Future

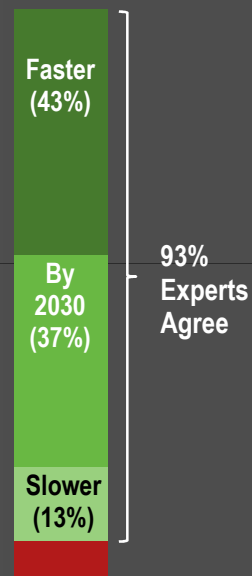
Source: Cisco IBSG, 2011

Your TV Follows You

Wherever You Go, Watch Your Own Personal TV Content on Any Screen at Hand



- Pay only one time and view your personal content anytime, anywhere
- Use any available screen to watch—your home TV, a hotel TV, or the seatback on the bus
- Shift content seamlessly across devices (e.g., from smartphone to a TV at friend's house)



Today

- TV Everywhere
- Portable device adoption

Optimized QoS & bandwidth-on-demand for mobile

Content rights on any device

Seamlessly shift content across devices

Public screens with auto authentication

Mobile phones as holographic projectors

Future

Source: Cisco IBSG, 2011

What Does It Mean for You?

Implications Span the TV Value Chain

Content
Creation



Advertising



Content
Aggregation



Service
Delivery



Devices



Data & Analytics, Metadata

Viewer Relationship

Digital Rights Management

Standards

Bandwidth

Computing

Sensory Technologies

Production Techniques

New Business Models

Source: Cisco IBSG, 2011

Call to Action: Accelerate the Vision, Improve Your Position

Production in the Cloud

Develop **web/cloud ecosystem** to facilitate flexible content creation/monetization. Include funding, pre- and post-production, marketing, publishing, and training.

Virtual Fan

Develop **immersive home entertainment experience** that brings excitement of live events into living room. Include multiple camera angles, social inclusion, stats, fantasy updates, expert discussions, and commerce.

Social TV

Add **new audio, visual and social inputs, and common controls** to make TV more interactive, independent of location. Create virtual environments for viewers to interact with each other and with characters.

TV-as-a-Service

Accelerate cloud-based technology for production and transmission. Virtualize and move to the cloud processes such as publishing, advertising, and CGI capabilities, as well as home hardware such as STBs and game consoles.

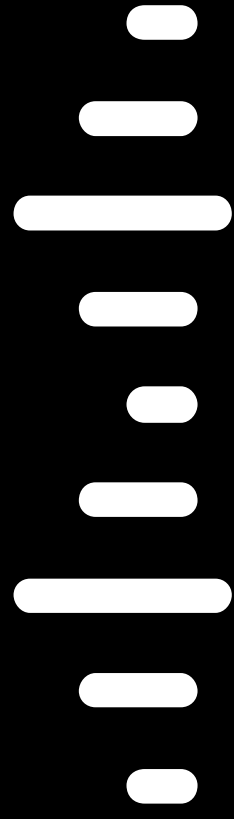
Next-Gen User Interface

Create **open, flexible interface** that integrates voice, text, point-and-click. Provide hierarchical and semantic data structure and presentation/search topology for use by SPs, media companies, and device manufacturers.

Mobile Video Optimization

Team up mobile SPs, content distributors, and device manufacturers to create better mobile video solution. Requires new architectures and regulations to make mobile experience match fixed video networks.

Source: Cisco IBSG, 2011



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