Broadband News Aggregator

Design Document
Masters Thesis Project
Information Design and Technology
Georgia Institute of Technology
April 2006

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1. Project Summary

Marshall McLuhan’s well-known phrase “the medium is the message” refers to the fact that the medium has an impact on content. Basically, we understand and evaluate messages in ways that are profoundly influenced by the delivery itself. McLuhan felt that media technologies give greater potential to our individual bodies by extending our senses and thereby extending our power in the world. Part of the “message” is the new, bigger scale introduced into the individual’s experience through the act of utilizing technology that increases the scope of connectivity.

We can see the medium’s impact on content in traditional news media. Radio and television news make audiences tune in at specific times. Internet news uses short video clips of recent news. The file compression process used to make video files small enough for efficient Internet transmission favors images with minimal movement and detail. For this reason, video created specifically for the web usually consists of the proverbial talking head with a monochrome background.

On the other hand, the emerging medium of interactive TV (iTV) holds the promise of new options in a broadband environment. The viewer has the ability to choose what they want to see, when they want to see it, and access to full-motion TV-quality video. ITV also offers new ways of organizing content providing an opportunity to deliver news from multiple sources.

The information overload on the Web has created a great need for efficient filtering mechanisms. The dramatic increase in the amount of news content available has created the problem of finding what is actually of interest to the individual viewer. It has become harder to keep up with all the news information available on the Web.

For my project, I propose a broadband iTV application that delivers news from multiple sources. The system architecture rests on a news aggregator in order to retrieve news feeds from multiple sources. By automatically retrieving updates, viewers can stay current with new content soon after it is published. The Flash prototype will model a broadband iTV platform such as Microsoft Media Center and demonstrate the following features:

- Feedback- Allows the participation in polls, surveys, and voting.
- Enhanced content- Allows access to additional contents such as maps, diagrams, or infographics.
- Immediate Access- Allows access to breaking news immediately.
- Archive and Retrieve- Allows viewers to archive and retrieve news clips.
- Personalization- Allows viewers to select news categories and reports they are interested in.
2. Problem Statement

My project centers on the problem that an effective news interface for broadband iTV platforms has not yet been developed in the United States. Technologically savvy young people no longer care to obtain information in traditional news format. They do not want to rely on the morning paper on their doorstep or the dinnertime newscast for up-to-date information; in fact, they want their news on demand, when it works for them. As a result of these changing habits, news organizations are rolling out new media technologies. These changes allow users more options to access news which includes how, when, and where the information is to be received.

Furthermore, the dramatic increase in the amount of news content available has created the problem of finding what is actually of interest to the individual viewer. It has become harder to keep up with all the news information available on the Internet. When people find a valuable news site, it takes work to keep up with developments they want to follow. They have to make an ongoing effort to regularly visit the site. Internet portals such as Yahoo address this problem by allowing users to create personalized pages that contain only information that is of interest to them. Yahoo users can gather content from multiple news sources across the Web and read it in their My Yahoo page. However, there is no effective news interface that can gather TV-quality video from multiple sources.

The system architecture of my project rests on a news aggregator in order to retrieve news feeds from multiple sources. The primary focus of my project is the information architecture and navigational issues of an effective news interface for iTV platforms.
3. Background

3.1. Demographics

User Demographics

- Age: 18 - 34 year old
- Gender: Male or Female
- Race: Culturally diverse
- Region: United States
- Education/ discipline: Bachelor's degree or higher
- Socio-economic group: $35,000 and $50,000 income level

General Characteristics

- Are tech savvy and desire to have the latest gadgets
- Young, well-educated, early adapters
- Look for several categories of news online, including entertainment
- Buy stand-alone DVRs and are interested in integrated DVR technology over stand-alone devices
- Create, produce, and participate in news and information in a connected, informed society
- Have broadband at home and are more likely than other Internet users to use the Internet frequently and engage in a wider variety of online activities
- Activities include blogging, sending IMs, using PDA’s, playing video games, and using picture phones
- Use media simultaneously, check email, use the Internet, use cell phones, or blog while watching television

3.2. Trends in interactive TV

Interactive TV

The trends arising out of relevant statistics on factors conducive to successful interactive TV deployment (e.g. television ownership and viewing habits, broadband and digital services, computer and Internet usage, ownership of mobile devices) indicate that as these enabling technologies continue to evolve, so are viewers’ media consumption habits. Most notably, while television is nearly ubiquitous throughout the United States, consumers are increasingly using it simultaneously with other media options such as E-mail, cell phones, or blogs. Statistics show that the timing is poised for successful and widespread iTV deployment, both in terms of technological advancement as well as consumer habits.
Currently, forty-five million households subscribe to Interactive TV service. This number is expected to reach sixty-nine million by 2009, more than half of TV households in the United States (Figure 1). “The debate over the future of interactive TV has shifted from if there is a marketplace to what applications should be introduced first and how quickly”, reports Kagan Senior Analyst Ian Olgeirson.

![Projected ITV-Capable Video Subscribers, 2004-2009](image)

**Figure 1:** Currently, 44.5 million households subscribe to Interactive TV service, the number of subscribers is expected to reach 69 million by 2009  
*Source: Kagan Research, 2005*

### Online News

The Internet is gaining as a popular source for local news, particularly among young adults, according to a Jupiter Research study titled *Online Local Content: Prioritizing Content, Blogs, and Community*. Jupiter's findings show that between 2001 and 2004, the share of people seeking local news online rose from four to nine percent of those surveyed, a thirty-five percent jump (Figure 2). The percentage may appear small compared to television news, which rated sixty-three percent in 2004, but television's increase only rose from sixty-one percent during the same period. Newspapers actually declined two percent over the course of the study. Jupiter Research points out there is cross-media activity, and many users visit the sites of their preferred offline newspapers on a regular basis.

Young adults, ages 18 to 24, are more inclined to go online for local and national or international news. Ten percent of them are consuming local news, one percent higher than the number for all respondents. In the case of national and international news, one third of young adults went online in 2004 compared to twenty-six percent of total respondents. This research shows young adults look for several categories of news online- including entertainment, and subsequently act as influencers, making recommendations to friends via e-mail and IM.
With a growing consumer broadband adoption rate as well as an increasing interest in watching news online, users have more control over what they watch. Recent reports reveal that more than seventy-five million users are already wired for high-speed Internet access at home while forty-five million have a high-speed connection at work. Furthermore, Nielsen/Net Ratings estimates that almost seventy percent of all U.S. homes will have broadband connections by the end of 2005.

Figure 2: between 2001 and 2004, the share of people seeking local news online rose from four to nine percent of those surveyed

Source: www.jupiterresearch.com, 2005
### 3.3. Competitive Analysis

Comparison of news media

<table>
<thead>
<tr>
<th>Media</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| **Newspaper** | • Good coverage (large percentages of households)  
                  • High local credibility  
                  • Low production cost | • Relatively low image quality  
                  • No audio support  
                  • No motion graphics  
                  • Inability to customize  
                  • Short life |
| **Magazine** | • High quality image  
                  • Segmented audience | • No audio support  
                  • No motion graphics  
                  • Inability to customize  
                  • Short life |
| **Radio** | • Ability to reach large national or regional audiences virtually and instantaneously | • No visual support  
                  • No motion graphics  
                  • Inability to customize |
| **TV** | • Demonstration ability by combining sight, sound and motion  
                  • Ability to reach large national or regional audiences virtually and instantaneously | • High media cost  
                  • High production cost  
                  • Inability to customize |
| **Internet** | • Ability to reach large national or regional audiences virtually and instantaneously  
                  • Ability to customize | • Requires high band width to watch video or listen to sound |
Direct competitors

**BBC News on Interactive TV**

The BBC is by far the largest producer of Interactive TV in the world. In the United Kingdom television viewers can press the “Red Button” (Figure 3) on their remote controls to access interactive programming. BBC News Interactive allows viewers to choose news and sport bulletins at the touch of a button.

In addition, BBC News Interactive allows users to select “Live Plus”, which will offer extended live coverage of news events and features. These will include discussions and forums when viewers can submit questions by E-mail or mobile phone text message to panelists and figures in the news. Mike Smartt, editor-in-chief of New Media at BBC News said: “New technology will increasingly allow people to choose what they want to see when they want to see it - and interact; taking part rather than being passive viewers. This is the start of a whole new way of receiving and consuming news, sports and other information and entering into a two-way relationship with the broadcasters.”

**Key features:**

- Allows television viewers to press the “Red Button” on their remote controls to access interactive programming.
- Allows users to select “Live Plus”, which will offer extended live coverage of news events and features.
- Allows viewers to submit questions by E-mail or mobile phone text message to panelists and figures in the news.

![Figure 3: BBC Interactive News](news.bbc.co.uk, November 20, 2001)

![Figure 4: BBC Interactive News](news.bbc.co.uk, November 20, 2001)

**Reuters interactive TV news channel for Media Center**

The Reuters news channel for Windows XP Media Center Edition delivers an interactive, full screen video news experience over the Internet to a home television set. It has been designed to have a similar user interface and navigation as the Media Center, with remote control navigation that accesses DVD-like menus by using only
the arrow keys and the select button. No keyboard, mouse input, or specialized controls are required making it well-suited for TV interaction.

Accessible through the Online Spotlight of Media Center, the Reuters news channel displays the first viewable frame of each video by thumbnail to make browsing easy. Videos are organized by channels - Top News, Business, World, Entertainment, Life, and Oddly Enough. Scrolling over the thumbnail reveals its title and brief description of the video and its time span. A video can be viewed full screen or as an inset to browse other stories. A broadband Internet connection is required.

Chris Ahearn, President of Reuters Media, said, “With analysts predicting that as many as 20 million people will be using Microsoft ’s home entertainment PCs by 2008, this channel offers huge potential to broaden Reuters reach within the consumer market. It offers a unique television news experience, powered by our global news network. Viewers get their own personal news network where they create the newscast and choose the stories that matter most to them.”

**Key features:**

- The TV service, delivered over the internet via the Microsoft Media Center, offers on-demand streamed video.
- Using the system’s remote control, viewers can select news categories and scroll through simple menus to the story they want to watch. The channel allows users to keep up-to-date on the latest stories as well as catch-up on stories they may have missed over the last seven days.
- Viewers can have a customized "tickers" with things that matter most to them. Tickers, run on the bottom of the screen with information such as headlines, and weather reports.

![Figure 5: Reuters iTV News Channel for Media Center](Source: today.reuters.com, September 20, 2005)
CNN Pipeline Broadband Video Service on the Internet

CNN Pipeline offers an unrivaled on-demand news experience that showcases the full depth of CNN's video resources. CNN Pipeline puts users in control of multiple live video streams, CNN’s video archives, and on-demand news clips from CNN’s unmatched newsgathering operation around the world. CNN Pipeline, which followed the introduction of new free video on CNN.com in June of 2005, is designed to meet the needs of consumers who want live, on-demand news they can select with a click of the mouse. Subscribers access CNN Pipeline by downloading an easy-to-use video player.

“With the upcoming launch of CNN Pipeline, CNN.com stakes out new ground for the online news user,” said Susan Grant, executive vice president of CNN News Services. “Together with our launch of free video in June of 2005, this groundbreaking premium service puts broadband consumers in the ultimate driver’s seat. You select whether you want to watch daily news clips for free on the site or any one of several live streams of news from CNN Pipeline. CNN.com offers a video news experience that is relevant, credible and catered to your needs.”

CNN Pipeline includes features such as an easy-to-use downloadable player, access to video content from the entire CNN News Group, multiple live videos from around the world and access to CNN’s video archives. CNN Pipeline subscribers can also access CNN.com free video features such as an on-demand “Video” section that showcases the best and most popular content, a unique “Browse Video” tool and “Now in the News,” an hourly web-exclusive news update. CNN Pipeline subscribers can also sign up for personalized alerts that notify them of breaking news on the topics that matter most to them.

Schematic, a leading interactive service agency, played a key role in user experience design for CNN Pipeline. “CNN Pipeline represents the future of media seamlessly merging the television experience and the Internet to offer the most informative and immediate news experience possible,” said Trevor Kaufman, CEO of Schematic. “Central to these efforts was recognizing that a simple, powerful, and compelling user interface is critical to audience adoption and ultimately to the inevitable success of the application”

**Key features:**

- CNN Pipeline subscribers can access CNN.com free video features such as an on-demand “Video” section that showcases the best and most popular content.
- Allows subscribers to access an hourly web-exclusive news update.
- Viewers can sign up for personalized alerts that notify them of breaking news on the topics that matter most to them.
CBS News on the Internet

CBS News and its digital content partner, CBS Digital Media, announced plans for a major expansion of CBSNews.com, creating a 24-hour, multi-platform digital news network, bypassing cable television in favor of the nation's fastest-growing distribution system -- broadband. CBS News will move from a primarily television and radio news-based operation to a 24-hour, on-demand news service, available across many platforms, drawing on the experienced, worldwide, and award-winning resources of the network.

Key features:

- CBS News.com offers breaking news, free broadband-quality video and original reporting, commentary and analysis directly to the fastest-growing segment of news consumers - those accessing news on the Internet.
- The debut of "Public Eye," a new blog that will create a candid and robust dialogue between CBS News journalists and the public. "Public Eye" will be edited by veteran reporter and media writer Vaughn Ververs.
- A fully redesigned home page featuring The EyeBox, an on-page video player which makes breaking news video immediately available.
- CBSNews.com will add more exclusive original reporting and commentary from CBS News. Throughout the day, CBS News correspondents around the world will file, update, and expand their stories continuously to enrich the editorial content by providing more insight and context. CBS Evening News anchor Bob Schieffer will host a daily online version of his television broadcast.

Figure 6: CBSNews.com
Source: www.cbsnews.com, December 1, 2005
Comparison of current iTV news platforms

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<tr>
<th>Platforms</th>
<th>Strengths</th>
<th>Weaknesses</th>
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<tr>
<td>BBC News (TV)</td>
<td>• High video and audio quality</td>
<td>• Inability to customize</td>
</tr>
<tr>
<td></td>
<td>• Ability to submit questions by mobile phone text message to news panelists</td>
<td>• Remote control navigation</td>
</tr>
<tr>
<td>CBS News (Internet)</td>
<td>• Ability to customize</td>
<td>• Require high band width to watch video or listen to sound</td>
</tr>
<tr>
<td></td>
<td>• Ability to blog with news journalists</td>
<td>• Low video and audio quality</td>
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<tr>
<td></td>
<td>• Deep archival news</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Keyboard and mouse input</td>
<td></td>
</tr>
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<td>CNN Pipeline (Internet)</td>
<td>• Ability to customize</td>
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<tr>
<td>Reuters News (TV/Internet)</td>
<td>• High video and audio quality</td>
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</tr>
<tr>
<td></td>
<td>• Ability to customize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Keyboard and mouse/remote control input</td>
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<tr>
<td></td>
<td>• Ability to have customized tickers</td>
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From the above platforms Reuters News for Media Center seems to be the most conducive to successful iTV adoption because it had high video quality and users can navigate with keyboard and mouse/remote control. The only weakness of this platform is that it requires high band width but this will not be an issue in the future since there is a growing consumer broadband adoption rate.
4. Proposed Solution

There are two main factors contributing to a need for an effective news interface for iTV. First is the expectation of the modern viewer- young, educated, and technologically advanced. Second is the potential integration between TV and the Internet in future iTV platforms. As the television and Internet continue to rapidly converge, this application will take advantage of the encyclopedic and participatory affordances of this new medium.

Traditional TV is a linear medium and news on traditional TV follows the same format. The Internet is procedural in the sense that nothing happens unless the user initiates it. Interactive TV stands somewhere in the middle; it can afford to deliver visually satisfying content in a procedural fashion without exhausting the audience with loads of text-based information. In other words, information could be easier to digest and the interface could be more user-friendly.

The information overload on the Web has created a great need for efficient filtering mechanisms. Many sites address this problem by allowing users to create personalized pages that contain only information that is of interest to the user. For example, Yahoo News offers dozens of RSS feeds. Yahoo users can gather content from multiple news sources across the Web and read it in their My Yahoo page. Programs with high-depth of information can benefit from iTV as a vehicle to meaningfully deliver the additional content.

This project proposes a broadband iTV application that delivers news from multiple sources. The system architecture rests on a news aggregator in order to retrieve news feeds from multiple sources. By automatically retrieving updates, viewers can stay current with new content soon after it is published.
4.1. Key features

Feature: Feedback

User Needs: Ability to participate in polls, surveys, and voting.

Live, dynamic polls conducted at critical moments in the news allow viewers to voice their opinions and establish a sense of community and involvement in the program. For example, during “The War in Iraq” program the following question shows up on the screen: The viewers are then able to vote using their remote control with the results being displayed live in a graphical format on TV.

"Do you think the US should keep military troops in Iraq?"
A. Yes
B. No
Feature: Enhanced content

User Needs: Ability to access additional contents.

This feature allows access to additional contents such as maps, diagrams, or infographics. Infographics or news graphics are a combination of words and visual messages that offer a sophisticated yet user friendly method to deliver complex data. The two forms of infographics are statistical and non-statistical. Statistical infographics convert numbers into a visual message. Non-statistical infographics can either arrange words or numbers into more pleasing and easily read displays or they can be used to illustrate a product or process.

The left side of the screen is used for infographics, giving the viewer a deeper understanding of the content. The infographics content is placed adjacent to the video. Much of this content is presented to the viewer in a careful choreographed manner that enhances the news story.

For example, if the news broadcast is about “Basra” the viewers can access maps, diagrams or infographics about the city of Basra. The map provides a sense of place to the viewer.
Feature: Immediate Access

User Needs: Ability to access breaking news immediately.

Figure 9: Breaking News Section

This feature allows the viewer to access a variety of live feeds. It is important that the application still has enough control to convey important breaking news and allow serendipity - so people might learn things from unfamiliar sources and not just from an echo chamber. The “Breaking News” feature includes small video feeds at the bottom of the screen. The video loops serve as a preview to visually help the viewer decide on what to watch.
Feature: Archive and Retrieve

User Needs: Ability to archive and retrieve news clips.

Figure 10: Saved News Section

This feature allows the viewer to save any news clip while watching it and access it later in the “Saved News” section. This section is a personalized space dedicated to all the saved news clips. The information is stored by date, with the most recent on top. The clips can also be sorted alphabetically by topic, program, or channel.

For example, the viewer can navigate and select a saved news clip, which then appears on the left side of the screen where the video can be watched. The viewer can then send a link to the video clip to a friend or delete it entirely.
Feature: Personalization

User Needs: Ability to select news categories and reports they are interested in.

Figure 11: Build Newsdesk Section

Active personalization lets users who need more customization specifically designate their interests. This level of personalization is designed to provide additional value to users in exchange for their preferences.

The “Build Newsdesk” feature provides news feeds from multiple sources. The upper area contains news categories and channels. The user is able to select the news categories and channels and then view the feeds that are available in the lower area. The news feeds can then be added or deleted from the application.

For example, if a viewer is interested in news about the Middle East from “Anderson Cooper 360” he or she is able to subscribe to “CNN: Middle East: Anderson Cooper 360” news feed. Then, in the “My Newsdesk” section they will be able to view video clips of their selected topic.
4.2. Categorization of news content

- **World:** Europe, Asia, Africa, Middle East, Americas
- **U.S.:** Northeast, West, South, Southwest, Midwest, Central
- **Weather:** North America, Europe, Africa, Asia, Australia, Central America/Caribbean, Middle East, South America
- **Business:** Market and Stocks, News, Jobs and Economy, World Biz, Technology, Commentary, Personal Finance, Mutual Funds, Money Magazine
- **Sports:** Baseball, Pro Football, College Football, Pro Basketball, College Basketball, Hockey, Soccer, Golf, Tennis, NASCAR
- **Politics:** Opinion and Analysis, Cartoons
- **Law:** Court TV, Opinion and Analysis, Supreme Court
- **Technology:** Internet, Personal Tech, Business Tech, Fun and Games
- **Science and Space:** Space, Science and Nature, Space sites
- **Health:** Conditions, Parenting, Diet and Fitness
- **Entertainment:** Movies, Music, TV, Books
- **Travel:** Destinations, Travel News, Travel Advisor, Business and Industry
- **Education:** Educational News, Learning Activities

The above news categories are based on most common categories from the news sites on the Internet. For the purpose of prototype development, I narrowed the news content down to World news category, particularly from the Middle East.
5. **Interface Design**

5.1. **Navigation Design**

When designing menus and navigation systems for television-based applications one of the biggest obstacles to overcome is the lack of on-screen real estate. Users find it tiresome to have to navigate with a remote control through multiple menus or have to return to a home page simply to find options. The menu design for this prototype provides the user with enough navigation options on-screen to keep any destination only a few clicks away while also managing to keep the screen from looking cluttered or confusing.

![Diagram of navigation design](image)

This navigation Design limits the number of clicks to get to an enhanced screen and eliminates the need to retrace steps by limiting the layers.

5.2. **Screen Design**

Aspect Ratio: This design uses the 4:3 aspect ratio because news programs currently use this standard.

Canvas Size: The dimensions 800x600 were used

Font: Two sans-serif fonts (Arial and Lucida) are used in this application and anti-aliasing is used to increase readability. Arial is clean and works well even at small sizes. Lucida looks great at small sizes and is one of the best screen fonts around.

Color: According to “Interactive Television Production”, white text on blue background is the most readable combination. Therefore this color scheme is chosen for the application.
5.3. **Typography**

Text poses difficult challenges on television screens, as viewers are not accustomed to reading static blocks of text on screen. At the same time the relatively large text size required for legibility on a television screen makes it difficult for designers to create effective screen layouts.

As a general rule, fonts must be used with care. Very light weight fonts or fonts with very narrow and broad strokes should be avoided. It is a good idea to use strictly constructive sans-serif fonts and use anti-aliasing to increase readability. Several rules can improve legibility on screen:

- Light text on dark background is slightly easier to read on screen
- Text on screen needs greater line spacing than in print
- When technically possible, tracking should be increased by up to 30%
- A full screen on text should contain a rough maximum of 90 words
- Text should be broken into small chunks that can be read almost instantly
- No more than two type faces should ever be used at once on screen

5.4. **Layout Design**

Interactive TV applications require additional space in which to present enhanced content. In recent years, two different layout conventions – overlay and the embedded “L” or split-screen design interface layout have emerged.

When graphic content must be combined with the video screen, typically the video portion is reduced in size and surrounded by graphics on three sides. This commonly used format has become known as the “L design”. The “L design” works very well provided that the content in the enhanced area is closely tied to the primary content of the program.

By using this layout, the enhanced content is wrapped around the video. This design unifies the text, graphics, and video of the application. It provides a consistent layout between screens and constantly orients the viewer with a fixed menu. The lower area is reserved for main menu navigation and sub menu navigation. The center area is used for the video and enhanced content. The upper area contains the logo and search area.
Figure 13: Layout Design

While all the menu items are displayed in the lower area, the main menu items are buttons on the right side. The sub menu items are small video loops in order to visually differentiate between the two types of menu items. Small video loops also serves as a preview to visually help the viewer decide on what to watch.

In the center area, a simple letter box format places graphical content adjacent to the video. Much of this content is presented to the viewer in a careful choreographed manner that enhances the news story. An example is providing a sense of place that correlated with the news story. The left side of the screen is used for interesting side information, giving the viewer a deeper understanding of the content.

Since this prototype will have a TV-centric interface, it should keep text elements to a minimum. In addition, text that is broken up into chunks is easier to read from a distance.
6. Implementation

The conceptual design is implemented as a news interface that adopts the usability conventions of interactive TV. The result of this project is presented in the form of an interactive TV portal interface. I use Macromedia Flash as the design tool in order to demonstrate the functionality and navigation of the concept.

6.1. Platform

This application is accessible through broadband interactive TV platforms such as Media Center PC. Media Center PC is a computer powered by Microsoft’s Windows XP Media Center Edition. It’s a complete Windows XP-based PC enhanced for home entertainment. Media Center combines the television and the functionality of the PC into one-screen platform. It can also be hooked up to a television that can be navigated with handheld remote control from across the room. Users can also use a wireless keyboard and mouse.

![Figure 14: Media Center PC Platform](Source: www.microsoft.com, March 20, 2006)

6.2. Remote Control

Various studies have shown that the computer mouse is simple to use and an efficient input method for the desktop graphical user interface (GUI). On the other hand, the remote controller is the most commonly used with consumer electronic devices that require simple input such as televisions. As computer technology becomes more advanced and their multimedia capabilities increase, we see an increasing number of computers making their way from the desk into the living room. The current desktop GUI loses effectiveness when viewed from a 10 foot distance.
Microsoft Media Center can be used in both the traditional desktop setting as well as the living room setting. This presents a unique challenge for interaction design since the design must work in the mouse-operated desktop setting and in the remote-operated 10 foot setting.

![Media Center Remote Control](image)

Figure 15: Media Center Remote Control

### 6.3. System Architecture

It has become more time consuming to keep up with all the news information available on the Internet. When people find a valuable news site, it takes work to keep up with developments they want to follow. They have to make an ongoing effort to regularly visit the site. This creates a role for news feeds and news aggregators.

Basically, a news aggregator is a software program that automatically retrieves RSS feeds from multiple Web pages. RSS (Really Simple Syndication) is an XML format designed for sharing web content like news headlines. News feeds come in a number of standard formats and are relatively simple items of code that can be retrieved and read by news aggregators and may contain headlines, summaries, excerpts, full text of articles, links, and even images. The benefits of news aggregators and news feeds are:
• Users do not have to visit each news site individually. Once they find a site and “subscribe” to the feed via their aggregator, they get their information automatically.
• News information from a large number of sites can be reviewed in a short time.
• Feeds can be sorted by subject into different categories.
• Feeds can be added and deleted easily.
• Information can be dealt with quickly and efficiently.

The system architecture of this project rests on a news aggregator in order to retrieve news feeds from multiple sources. By automatically retrieving updates, users can stay current with new content soon after it is published.

Functional Specifications

• Accessible through broadband interactive TV platforms such as Microsoft Media Center PC.
• TV-centric interface with an “L design” layout.
• Keyboard and mouse/remote control input.
• Ability to retrieve news from multiple sources.
• Macromedia Flash/Actionscript for the purpose of prototype development.

6.4. Metadata Structure

This application assumes that all the video clips are tagged. The concept of metadata conveys the idea of accompanying data with their descriptions. As data about data, metadata can provide an insight into synthetically and semantically complex data by distilling their essence into a set of descriptors. Metadata also helps to structure and manage information in diverse settings. In broadcast multimedia, metadata covers both the description of services and multimedia content. Metadata integrates fully into broadcasting value-chain with considerations for each step in the development of a digital broadcast service.

Attributes described by program related metadata can include anything from simple electronic programming guide data (channel, program name, title, date, etc) to a complete index of different scenes and associated enhancement content with in-depth rights information detailing how the content package may be displayed, copied, or sold. In the context of interactive television, metadata can enable anything from URL pointers for non-synchronous download of enhancement content, to incorporate advanced searching and parsing of video content and descriptions of the enhancements themselves.
6.5.  Video Indexing

Typically the indexing of a news program consists of the following steps:

- Segment the video hierarchically into sequences, scenes, and shots. (A shot is a continuous sequence of frames captured from one camera. A scene is composed of one or more shots which present different views of the same event, related in time or space. A segment is composed of one or more related scenes.)
- Describe the complete video - bibliographic information (title, creator, dates, subjects, item numbers, publisher details, names, synopsis etc.) plus format, frame rate, duration etc
- Describe each sequence - id, start time/frame, end time/frame, brief textual summary
- Describe each scene - id, start time/frame, end time/frame, brief textual summary, transcript (ideally derived from a closed caption decoder)
- Describe each shot - id, start time/frame, end time/frame, keyframe - first frame of the shot (ideally derived from an automatic shot detection algorithm)
7. Design challenges

7.1. Interaction Design

One of the biggest challenges of iTV applications is finding a framework for interaction design that works with the new environment. Television viewers are used to the “lean back” model of watching TV. On the other hand Internet users are used to the “lean forward” model of using a computer and prefer not to squint to read menus or think too hard about where they are. This presents a unique challenge for interaction design since the design must work in the remote-operated (10 foot interface) and the mouse-operated desktop setting (2 foot interface).

The interface should be designed to look good whether the user chooses to lean back or lean forward.

7.2. Passive vs. Active Personalization

Passive personalization will intelligently present the user with related information as the user browses the application, attempting to get the user to take action he or she might not know about otherwise. This personalization happens automatically, without the user having to explicitly ask for it - making it exceptionally powerful even for users that may not be fully engaged with the application.

By contrast, active personalization lets users who need more customization specifically designate their interests. This level of personalization is designed to provide additional value to users in exchange for their preferences.

Supporting both types of personalization is critical - some users will be passive, but the ones that choose to actively personalize should be able to do so. The application should provide both forms of personalization.
8. Extending the Design

**Recommendation:** This feature would recommend new or upcoming programs to the user based on previously established habits and preferences. The system would analyze the viewer’s preferences, habits and history and then compare them with other habits to make recommendations. For example, the viewer would get a message like: “**Viewers who watched ‘Kofi Annan calls off Iran trip’ also watched ‘Syria rejects U.N. resolution’**”

**Tickers:** This feature would allow users to customize "tickers" with topics that matter most to them. Tickers will run on the bottom of the screen with information such as headline news and weather reports. For example, a viewer can set their ticker to breaking news about the war in Iraq.

**Television Design:** Viewers are not accustomed to reading blocks of text or viewing static pages on a television screen. Therefore, the next stage of this design would include animations and background movement to make the application more fluid and look like television screen design.
9. Conclusion

The broadband quality of iTV holds a great promise by providing a variety of new options. The viewers have the ability to choose what they want to see, when they want to see it, and access to full-motion TV-quality video. Interactive TV offers new ways of organizing content as well as the ability to deliver the information from multiple sources.

With this project, I have attempted to design a broadband news aggregator in order to retrieve news feeds from multiple sources. The same news story is presented from multiple perspectives based on the news organization providing the story. This gives viewers a well-rounded view of a particular issue, especially when various international spins are presented.

Furthermore, the proposed project offers features that enable viewers the ability to engage with the content of the program including the following:

- **Feedback**- Allows the participation in polls, surveys, and voting.
- **Enhanced content**- Allows access to additional contents such as maps, diagrams, or infographics.
- **Immediate Access**- Allows access to breaking news immediately.
- **Archive and Retrieve**- Allows viewers to archive and retrieve news clips.
- **Personalization**- Allows viewers to select news categories and reports they are interested in.
10. References


11. Appendix A: Demo Script