MicrosoftTokenTV: TV meets .NET

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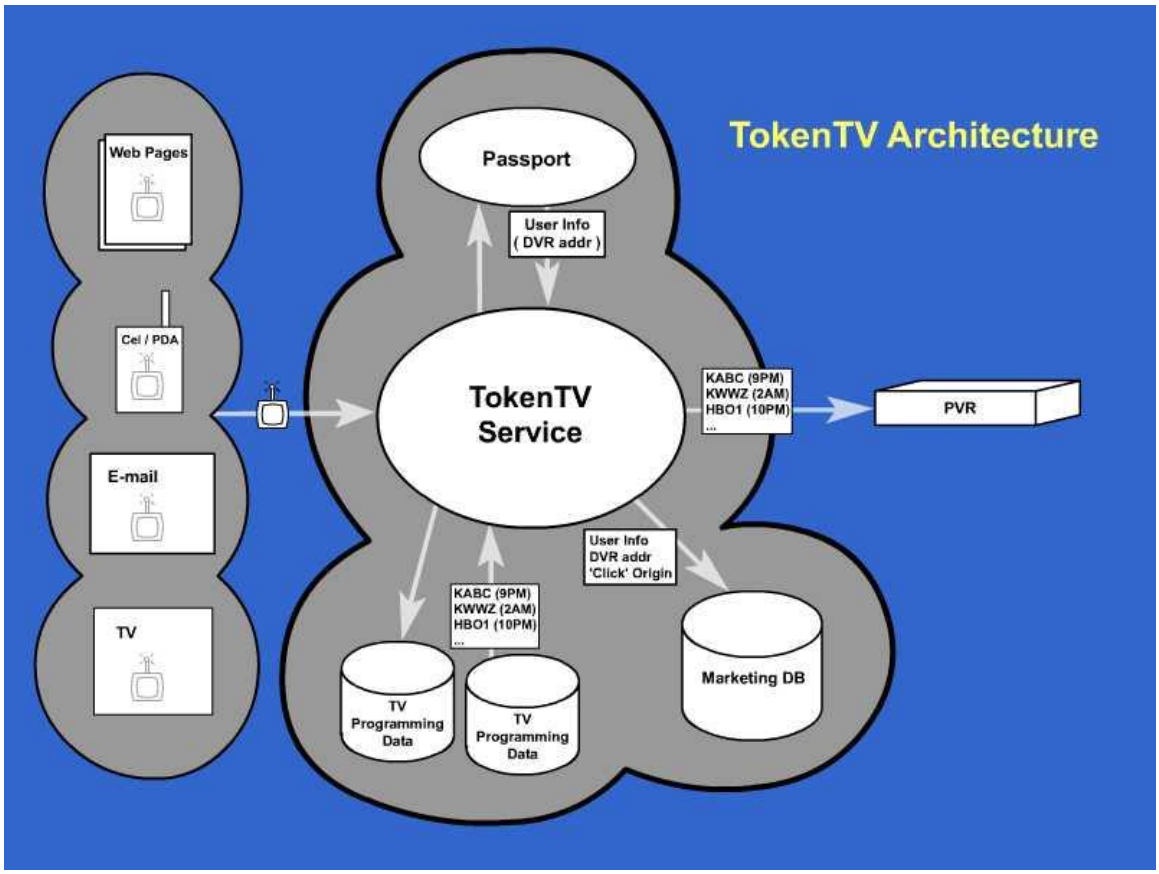
Introduction

This paper discusses an application of existing technology combined in a new way that could be implemented at Microsoft and enhance .NET functionality to broadcast television. The fundamental issue that we wish to discuss is how to fashion the appropriate business strategy to best apply this technology towards enhancing Microsoft's television platforms.

Specifically, TokenTV is an architectural blueprint for a service that would allow convenient remote programming of Personal Video Recorders (PVRs) and delivery of TV related services. Moreover, it is designed in such a way that allows third parties to build upon a platform provided by MS that can greatly increase the influence of the Internet and the .NET approach to the Television space.

PVRs are already turning the TV into a device that enables users to watch what they want, when they want it, and less when the content airs. By opening up remote PVR recording to email and the Internet, we can enable PVRs to be remotely directed to record broadcast television programs from anywhere and any device. This is not just about the convenience of remote programming, but enabling everyone to easily record and share television programming without the gating factors of transport bandwidth or copyright infringement issues.

TokenTV enables 3rd parties to build business and content services around delivering (via TVTokens) broadcast television programs and related services enabling a new level of consumer convenience. Examples of these will be described later in this document.



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TokenTV System Architecture

The core TokenTV system consists of several components necessary to ensure basic remote recording of specific broadcast content on a designated PVR. There will be other components to enable other services but the basic elements include:

1. TV Token - A method of encapsulating a unique program identifier (such as a globally unique ID –GUID) along with other descriptive program information in XML format that can be resolved to a specific TV program in order to later determine its broadcast date/time/channel/duration in any geographic location and send a discrete recording instruction to the correct person's PVR. It is important to point out that TVTokens only contain data to resolve what the TV program is and not information about when and where the show will air. This enables the transportability of the Token across different locations, time zones, and TV service providers.

   Tokens could be found on any participating websites or EPGs (Electronic Programming Guides) and could be exchanged via email as simple attachments or as web links. Websites should allow users to browse them and click on tokens which would allow "One-click recording" of upcoming television shows and movies. These web sites could be made available via WAP or other formats to allow for convenient browsing on handheld PC's, cellular phones and other devices. Users should be able to easily get tokens from any source and share them with others. Finally, subscriptions to tokens could be managed either via conventional email as attachments or with an interface more suited to subscription management at the central TokenTV service web site.

2. TokenTV Service – A service which does the following:
   - Translates the TVToken GUID or program descriptive information into local program recording information
     i. Takes source and program GUID to resolve program identity
     ii. Associates user information profile (location, PVR box ID, service provider, premium content privileges, etc.) via user identity (Passport) and user registration of PVR.
     iii. Maps the above information to the broadcast time/date/channel/duration for provider broadcast in the location of destination PVR.
   - Provides centralized point for communicating with the client PVR.
   - Creates individual and aggregate logs of content preference data.
   - Centralized tracking of content to enable intelligent recommendations of related content and services (considering privacy issues)
   - Collection and prioritization of Token subscriptions (i.e. Ebert's movies of the month with PBS's best shows of the month)

3. TokenTV Transport – There are two parts of the TokenTV transport.
   - Website delivery of MS TVTokens to TokenTV Service – Tokens can be passed along with a URL as a POST or GET message. In their simplest form, they can be simply a GUID and a source for interpreting the GUID so that they can be concisely embedded in a web page in the following manner:
     <a href="http://www.tokentv.microsoft.com?guid=123af2ecef1b?src=ms">
     .As they become more lengthy XML embedded in the bed, any standard

mechanism for transferring XML islands of data to web sites can be used.

- TokenTV Service to PVR - Communicating between the TokenTV Service and the PVRs with specific date/time/tuning/duration instruction. Getting the resolved token recording instruction to the PVR can happen a variety of ways depending on set top box communications channel. Examples include:
  i. Nightly POTS dialup from the PVR to TokenTV Service in order to download record data (record latency issues)
  ii. Use of trickle-down channel on satellite and cable boxes (requires cooperation from MSO).
  iii. Always-on connection (cable-modem or DSL) that has a back channel (better solution).

4. Token TV Client – Client PVRs that can receive specific record instructions from the TokenTV Service (dumb client) or receive Tokens directly (smart client) and resolve the tokens locally and schedule the recording.

- Client STB Token software – In the simplest case, the STB need only respond to remote scheduling requests from the TokenTV Service that consist of data/time/channel/name tuples. Smarter boxes might do more of the resolution on the box since they often contain EPG data for other purposes. For the service to effectively manage conflicts in scheduling, the box should also be able to respond to a more general file management API which might include requests for the list of programs to be recorded, deleting of a pending recording instruction, or deletion of an already recorded show.
- Client PC Token software – Presumably, a PC with a tuner card capable of video capture would make an effective client for TokenTV. It may be more likely that it would be continuously connected to the Internet, which would allow greater negotiation in scheduling and program management.

TokenTV scenarios

Re-Defining a Television Network

1. Personal Networks

A trusted television or film critic such as Roger Ebert could have their picks of the best television movies broadcast this week or month. By subscribing to that list from his website, you could get regular emails containing MS TVTokens for his picks of the best movies for that period of time. You would just go through the list and delete those you didn't want to see and forward the tokens to your TokenTV Service for recording whenever they came on. These movies might be broadcast from a variety of networks or channels, which are all transparent to the viewer.

Personal networks wouldn't be limited to major film critics. Family, friends, fan sites can create TVTokens and share them with others via their own websites or through email distribution lists enabling viral marketing.

2. Passive program collection

Another idea related to personal networks is that of passive program collection. Many of us have looked at the American Film Institute's Top 100 list of movies of all time and noted the films that we'd like to see but somehow we never get around to remembering them at the video store. In this scenario, if the AFI website were MSTokenTV enabled, you could just download that list of 100 tokens and forward them to your own PVR to record any of those films whenever them come on.

3. IMDB Tokens

If you were looking for a movie to watch, you could search the Internet Movie Database to find the perfect movies to watch and then download the Tokens for them to forward on to the MSTokenTV service and sharing with friends for recording whenever any of them are broadcast. Collaborations with content providers to provide the token technology would enable them to be the focal points for "delivering" television programming.

4. Emergent services

Some new services may even emerge: imagine a requests channel that would monitor token requests and purchase rights to air movies based on demand. Different interest groups could have their own requests channels. Top requested tokens could also be listed on sites, much the same that Nielson ratings or best-seller book lists are currently listed.

A New Advertising & marketing model

MSTokenTV enables a much closer coupling of television with viewers for targeted direct response advertising and commerce. Broadcasters and 3rd parties can provide much more tailored eCommerce and services by specifically targeting individuals using email to deliver TV shows and related merchandise opportunities.

1. Expedia.com TV

Expedia could evaluate the travel shows which are scheduled for broadcast and assemble travel packages customized for those destinations appearing in the show and send out an email with a token to record the show along with a "one click to experience that same trip yourself". This would enable those who watched the show to respond to the email directly for specific tour packages and capture the excitement of the destinations from the travel show.

2. Direct Response Advertising

The Preview channel - If you were interested in movies, you could sign up to be on an email distribution list from the major studios to receive tokens for recording the trailers for the latest movies coming out (broadcast in the middle of the night). By watching the preview and responding via email with the right answer (from viewing the trailer) the person could get a discount for the film at their local theater.

3. Direct Response commercials

Marketers could send email out with a token that would record just a commercial that had some question/game. Watching the commercial and replying to the email with the answers to the questions would enable them to receive a free product samples in the mail.

4. Personalized Home Shopping Network

While it is clear that the immediacy of live home shopping is key to its success, prior customers who indicate their interest in certain types of merchandise can be alerted via email for a token that would record upcoming specials for those items they would be interested in. The person could then quickly skip through to the items of interest and complete the transaction via secure email or a telephone call.

5. Next Generation Neilsen Ratings

The Neilsen ratings are all based on historical data collected through the small number of data collection boxes and manual records kept by viewers. Advertisers have no idea about the relative success or failure of a show until after the show airs and ad rates are based on Sweeps week ratings that are then extrapolated to ongoing shows. The advantage of a TokenTV Service is that by creating a clearinghouse for MSTVTokens is that the data for what people are going to watch is determined in advance. If general demographic profile information is collected, it is possible to predict the demographic viewer ship of shows in advance of the actual show airdate. This kind of information would be invaluable to advertisers who have the capability to dynamically adjust the nature of advertising if it appears the size and nature of the audience is known in advance. This presumes that the TokenTV Service ends up being a centralized clearinghouse for token resolution. If TVToken service becomes decentralized accurate projections become more difficult.

Establishing a direct relationship with each viewer

1. Targeted Network Programming

PBS has always been at a challenge of what to offer its paying subscribers other than the premiums that it offers during Pledge Drive. With this system, PBS could offer for its premium subscribers the service of allowing them to select all the specials that are scheduled for broadcast during the coming year. Premium subscribers could then download TVTokens and forward them to their TokenTV Service or PVR for recording at broadcast.

2. The Network/Viewer relationship

Once the network establishes a direct connection to the viewer via email subscriptions with tokens, it enables opportunities to deliver specific tokens for shows to specific demographics. Currently with primetime, the highly rated show provides a lead-in for a new show airing directly afterwards. With TokenTV the customization of TV programming and custom delivery of specific shows to specific groups illustrates how the world of broadband Video On Demand might look.

Enhanced EPG services

1. Enhanced EPG service functionality

Current web based EPG services such as TV Guide and GIST can provide program listings for most service areas when provided with zip code and service provider name. When the user provides an email, these EPGs provide reminder services of when programs of interest are selected. One of the advantages of creating a web based enriched Web based EPG is that other technologies can be brought in to enhance the ability to find quality television shows. Collaborative filtering techniques can be applied so that as the user selects from various criteria by genre and other criteria, the EPG can be suggesting other programs of interest based on other people's patterns of interest. "People who liked X-files also liked the following programs". With MSTokenTV any EPG or other website with information about television shows can be enhanced to "deliver" the TV shows as well by incorporating TVTokens.

Token TV Progress to date

Patent applications

Next Media Research filed five Token TV patent applications on September 7, 2000, and claim priority to a provisional patent application that was filed on March 30, 2000. The patent specifications of the five patent applications are similar. Each contains a description of the overall system and service, with sections describing the Token TV system/service from the client perspective, from the Token TV "clearing house" server perspective, and from a third party server perspective. The claims of the five applications focus on different aspects of the Token TV system/service. Details of the patent summaries are included in the reference section of this document. The name NGPTV was the original name for TokenTV back in January which signified Next Generation Personalized Television.

149506.1 - NGPTV (provisional - filed 3/30/00)

149506.2 - NGPTV (full application – filed 9/10/00)

150957.1 - Nielsen Ratings

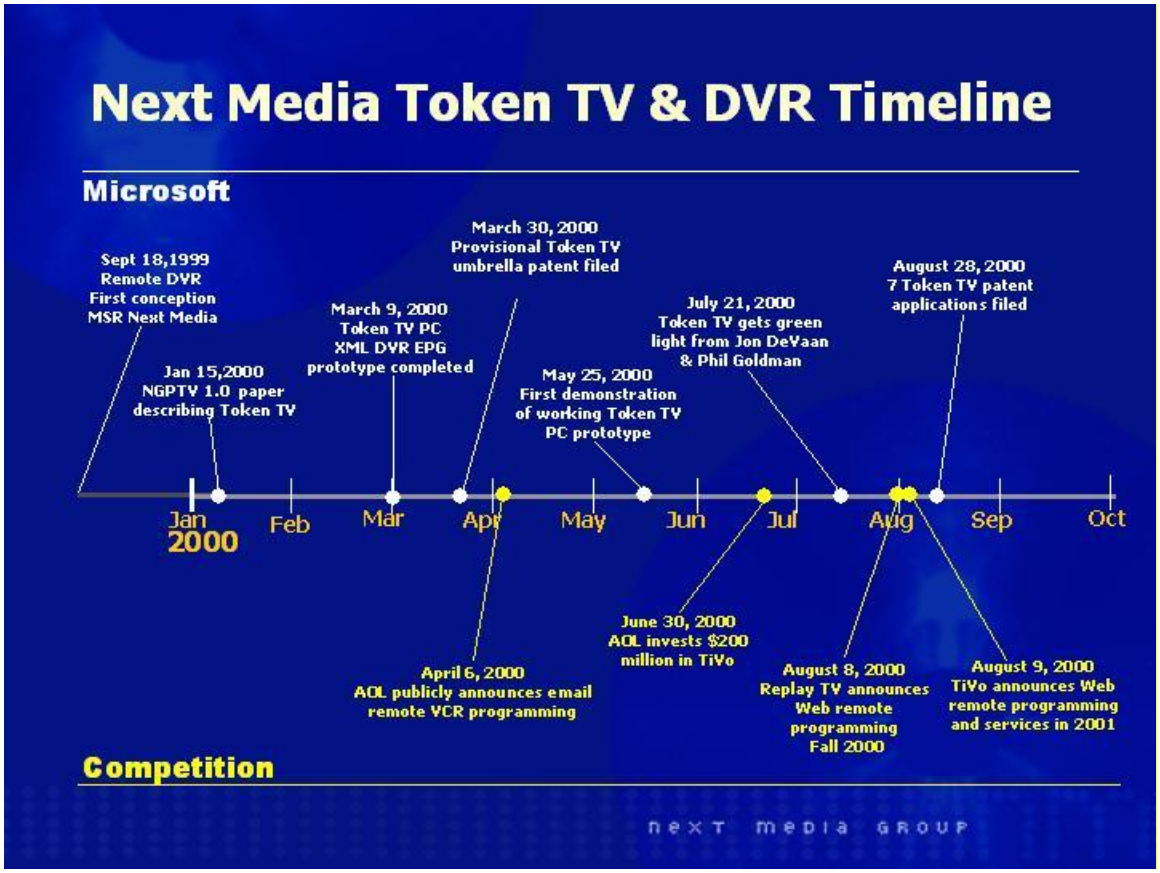
150958.1 - Network Programming

155613.1 - PC Filtering EPG

150614.1 – Standard Token Schema

An XML prototype TokenTV EPG using Tvdata http://nextmedia1/programguide3.htm

MSTokenTV timeline:



Contacts:

Partial list of people familiar with TokenTV

Consumer Strategy

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Suze Wolf

TV Platforms

Jon De Vaan

MSTV

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Paul Mitchell – Sr Mgr Content Evangelist
Pat Griffs – Director worldwide TV strategy
Skip Pizzi – Technology standards TVAF
Sam Reich – Communications Group Manager
Ed Graczyk – Lead Marketing manager Platform marketing
Tom Firman – Director of Technology
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WebTV (cont)

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Issues and challenges for launching TokenTV at MS

Common questions that we can address:

Do people want to program remotely?

Remote recording does not appear as a commonly requested feature because users are not aware of the conveniences resulting from having that capability. At first impression, programming your PVR via the Web might seem to be something that only a geek would want to do. While TiVo and Replay are going down the 2nd generation PVR path of "easier programming via the web", MSTokenTV is a 3rd generation PVR which is enabling the easiest programming of all, letting others (trusted sources) do the programming for you and delivering those programs directly to your PVR (with your prior authorization).

MSTokenTV allows 3rd parties to deliver content and services on top of broadcast television. These opportunities would include critic sites, community sites, fan sites, advertising and promotional sites.

Why would people trust Microsoft to do this?

One way to go about this is to make sure that the standard is open and that we offer the best service: most accurate and complete token resolution, best management of user subscriptions, best linkage with other Microsoft properties. Pricing models for a service also might be made explicit: the service could be free if all demographic information is shared; minimal fee for allowing aggregate data to be shared; and a higher fee with a guarantee that all information is private. For many parties, this would help create more explicit linkages between television programming and the web and would work in their best interest.

How are we going to get broadcasters to do this?

Broadcasters have hated the arrival of PVRs especially with their ability to skip commercials. The New York Times Sunday cover article Boom Box focused specifically on this problem. Other possibilities for Broadcasters would be Targeted Network Programming where MSTokenTV enables them to establish a direct relationship with each viewer by allowing them to send tokens directly to viewers thus enabling customized distribution of specific shows and associated services to specific groups based on their interests.

How do third parties create tokens on their own sites?

There need to be a number of different strategies for token creation. Third parties will want a minimum amount of additional work on their web sites and many third parties will not be willing to go to an external resource for unique ids for their own television shows. Therefore, there needs to be a token schema that is easily authored, and that can be unambiguously resolved either at the service or at the STB.

i. In its simplest form, a token can simply be a UID that is obtained from a part of the service where a web based app allows third parties to search for entries and returns tokens. Most likely, that token will be really a pair of info – the source where the UID is from, and the UID itself. These simple tokens can be embedded in a web page in an abbreviated form:
<a href=http://www.tokentv.microsoft.com? uid=a531f12efd?src=tms>
   a. Advantages: easy to incorporate in web pages, easy resolvability by service
   b. Disadvantages: relies on UIDs existing from the service and a mechanism to retrieve them and incorporate them into the web site. No mechanism for dealing with things not yet in a television database.

ii. Tokens may also be in a much more generic form – for instance for a movie, the third party should be able to specify a title and a year which has a high likelihood of being unambiguously resolved. For a series, the series title and episode number/title could be used. Currently, the specification for tokens allows for extendibility by third party, with certain implementation standards supported by default. (See token spec). An app might help out with this too, but this could also easily be coded by hand.
   a. Advantages: anybody can author tokens without the need of a central repository of unique ids. Shows do not yet need to scheduled or entered into a central database.
   b. Disadvantages: would require authoring of XML into a web site, and a mechanism to send the XML when clicking on a link embedded in the web page (there does not yet seem to be a standard way to do this).

iii. Yet another strategy might be for certain sites to create their own UID's and publish that information to the TokenTV service. Thus a token on an ABC site might just have the source "ABC" and a UID. When resolving this token, the Token TV service would first look at the source of the data and then look up the corresponding entry in the database provided by ABC. In this strategy, further resolution would need to occur to match the entry provided by ABC with scheduling info currently provided by a tv data provider (TVData, Tribune Media Services TMS, etc.) Also, a mechanism for publishing the data between the third party site and the Token TV service would need to be worked out.
   a. Advantages: relative autonomy in token creation for the third parties, convenient incorporation into web site
   b. Disadvantages: other mechanisms would need to be put into place. One possibility is a database that maps between src,UID's and more complete extended XML descriptions of the show all at the third party site. The XML could be published between the third party site and the token TV service and the token embedded in the web page would still look in the same way as in option 1.

iv. There is also the possibility of using smart tags (automatic recognition of television info in a web page and creation of corresponding tokens on the client side – similar to FlySwat for Television info).
    a. Advantages: Minimal work needs to be done by third parties
    b. Disadvantages: There might be difficulties in generating reliably accurate tokens. This would require development of an add-on app to IE on the client end or a way of filtering pages received through a service.

Strategically, the current providers of television listings might be the best group to target to adopt tokens into their listings (GIST, TVGuide, etc.). Also, the information providers (such as TVData and TMS) would be good targets to incorporate tokens since they are currently acting as the clearinghouse for television information. Subsequently, more minor third parties, such as IMDB, Entertainment Weekly, etc. will probably be more amenable than the major networks towards incorporating tokens into their sites. After widespread adoption by the other parties, the major networks would have incentive to follow suit.

How do tokens get transported to the STB?

Currently, many boxes use POTS to download electronic program guide data and tokens could be retrieved at the same time. The biggest problem with this strategy is that EPG data is typically downloaded each evening in the middle of the night. This presents latency issues of recording shows which air prior to the tokens instructions reaching the PVR. Many homes only have a single phone line so that attempts to download tokens more frequently or at other parts of the day can interfere with household telephone service. Also, either a toll-free number must be used or an access provider arrangement would need to be made.

Other boxes could use trickle-down channels available in digital cable feeds and satellite boxes. This is not necessarily available to all service types and would need to have deals with MSO's.

Some boxes might be continuously connected to the Internet via cable-modem or DSL. This would allow communication via TCP/IP, or even other Internet protocols like http or POPS3.

How is a token different from a URL link?

Tokens need to be resolved differently for people receiving them in different locations with different local broadcast times/stations/ channels and can't be one standard link to a fixed location.

How is this different from a Napster for TV?

Tokens are references to TV content to be recorded when broadcast. Since the content itself is not currently being shared directly, there are no issues with copyright as with Napster. In the first incarnation of MSTokenTV, the conditional access (CA) for premium content (i.e. HBO) is handled by the cable box so if the person has the right to record the show for personal use, the Token will record the show, if not the Token will record a scrambled signal which is the same result that the person would get with recording a premium channel today. Digital rights management definitely needs to be considered to protect rights holders as the installed base of PVRs and Broadband grows to prevent inappropriate distribution.

What about conditional access and digital rights management?

In future versions of TokenTV, CA and DRM need to be considered to as a part of the TVTtoken. This will enable things like sending people Prepaid PPV movies and other scenarios enabled by .NET functionality.

What does this mean for Video on Demand?

In many ways, PVRs are a bridge to Video on Demand without having to deal with bandwidth constraints. Even with DSL or fractional T1, watching streaming media is occasionally painful depending on network traffic. Even though capacity is increasing, so is the growth in higher bit rate streaming media. Consequently we believe that there will continue to be cost effective reasons for broadcasting and caching the bits whenever it is broadcast for playback in offline mode. One consistent trend with PVRs is that viewers tend to watch much less "live" television programming in lieu of the convenience of offline pause, skip, and fast forward functionality.

MSTokenTV can provide the foundation for Video on Demand by developing content retrieval portals in advance of the build-out of needed infrastructure. Portal sites with critical reviews, communities, and other means of recommending content will become increasingly important and when coupled with MSTokenTV technology enable these sites to "deliver" content via tokens.

Another near term video on demand broadband strategy is to download premium content offline to the PVR and charge a subscription for offline access to all of the downloaded content. This optimizes server loads and subscription provides a steady stream of income unlike typical VOD scenarios. TiVo has just recently announced this strategy that they are calling Subscription Video on Demand.
Starz Encore Group and TiVo Kick Off Integration of Subscription Video-On-Demand on the TiVo Service

Questions for executive staff

Should this be a platform play or a service play?

This depends on the revenue model and MS's interests in the platform vs. service revenue. To explore the space, we include the following possibilities.

1. Platform play – Implement MSToken TV without a MSTokenTV Service

   This entails putting all the token resolution into the box and standardizing on a public token specification on the web. This would then become a value add for MS TokenTV enabled boxes which could be WebTV boxes or any MSTV platform built boxes. There would still need to be at least some service for getting EPG's and delivering tokens to the boxes.

   However, MSTokenTV probably would not be the distinguishing factor by which an MSO would use MSTV as an OS for their STB. Consumers might pick a MSTokenTV box over one that is not enabled, but only if there is already a significant installed base. In time, PVRs will probably be built into TVs and other STBs. It may be difficult to make money over the long term by this strategy given the thin margins in hardware without some other source of service revenue.

   - Potential revenue streams
     - Sell more boxes with MSTV OS with Token TV - Enhanced functionality for the platform driving greater adoption of the MSTV platform OS over competitors.
     - Sell MSTokenTV functional enhancement upgrades – May be able to sell additional software in the set top box for enhanced local TVToken functionality

2. Service play – Create a MSTokenTV Service

Create a middleware service that talks to a variety of different boxes and enables third parties to embed tokens in their sites. This service could have different mechanisms for communicating with boxes that have different capabilities. There is the opportunity for centralized demographic data collection, which could be valuable data for collaborative filtering, advertising targeting, and potential licensing. Revenue might also be made via service subscription fees or portal fees for adapting MSTokenTV to run on a variety of wireless devices.

However, there could potentially be many competing services and Microsoft would need to distinguish itself somehow in this space. Possible service enhancements could include: providing more accurate token resolution, better collaborative filtering, better conflict resolution, including links for streaming media previews with all tokens, better links to other Microsoft properties, better packaging of related services or better deals with third parties.

- Potential revenue streams
    - MSTokenTV server revenue – Sell the MSTokenTV server software to enable MSOs and others to run their own MSTokenTV service. i.e.: ATT could run their own MSTokenTV server enabling all the content sites within their walled garden or their own customers to share and use tokens with among themselves and others.
    - MSTokenTV Service revenue from customers using MSTokenTV
    - Aggregation of content preferences for millions of viewers for content related advertising (considering individual privacy issues)
        - Licensing of aggregate demographic data to third parties.
    - Enhanced content selection subscription services – i.e.: someone to pick your programs for you and send them to your PVR
    - Licensing fees of technology to third party service providers
    - Advertising revenue from a TV website for TVTokens

Where would TokenTV Service fit organizationally within Microsoft?

i. MSN

MSN might be the best place to run consumer services. Conceptually and architecturally it might be very similar to other Passport enabled services like Wallet (instead of facilitating one-click purchasing, it facilitates one-click recording). MSN Communities linked with MSTokenTV might greatly facilitate communities for television watching. MARS already has a MyRadio and a MyCalendar section so a MyTV section would make perfect sense. Hotmail could be useful for token transport and email addresses for boxes. This could potentially work with all PVR boxes, including those made by third parties (like Replay who appear less interested in selling a service).

ii. WebTV

WebTV already manages a TV related service, already has some facilities for PVRs and manufactures PVR enabled STBs. They also already have licensing deals for EPG content from TVData and TMS. One disadvantage is that it would only work with WebTV boxes.

iii. MSTV

MSTV would be a logical location for MSTokenTV Service which could theoretically handle both MSTV and WebTV but MSTV is not a service organization except for the MSTV server. This could be built into the

MSTV server as an added feature, but probably would not greatly affect the decision by an MSO to use the MSTV server. MSTV also has little infrastructure or experience in supporting a 24/7 TV service.

iv. Outside Microsoft as a 3rd party

TokenTV Service could conceivably exist outside of Microsoft as an outside service supporting MSTV, WebTV and TV enabled PC's such as Whistler boxes. In that role it might also work supporting TVToken resolution for other box manufacturers such as Replay.

Should TokenTV be open to TiVo & Replay to accept tokens?

If the strategy were to become a service that incorporates the highest volume of subscribers, it would make sense to try to pull in as many STBs as possible. If the point were to distinguish Microsoft boxes from other boxes, then 3rd party boxes would need to be excluded. It is not clear what incentive TiVo and Replay would have to accept tokens except through explicit business relationships. Since TiVo is already in the service business and closely aligned with AOL, Replay may be the only PVR interested in such a partnership.

What specs need to be open, and what specs need to be closed?

In general, the specs for the tokens would need to be open since the idea is to get as many third party content providers signed on into incorporating tokens into their sites. However there may be potions of the token which might be proprietary which would enable better value for Microsoft services or Microsoft STBs.

The Opportunity & the Competition

We have the opportunity, the experience and the platform to pull this off first and change the face of television. If we can implement this technology quickly and market it well, we can change the definition of prime time or what it means to be broadcast network, and build the bridge towards video on demand.

There are lots of other scenarios that are possible with this platform enabled but we need to get this going ASAP before the competition brings something to the market. In Next Media, we have filed for a number of patents related to MSTokenTV and are defining the architecture and XML token specs for the TVToken, as well as building a working STB prototype. The majority of our work has been evangelizing anyone and everyone within the TV groups within Microsoft to embrace this and build this capability into MSTV, WebTV and embedded Whistler.

While all the product groups feel that this is an exciting feature, perfect for the .NET initiative, and they all want to include it into their schedule and feature list, they know that to realistically get it into the box, it will take executive decision to say that we are moving a ship date to make this happen soon before AOLTV, TiVo or possibly Liberate announce this functionality. We don't want to slip any ship dates but we also don't want to wait two years before this feature comes to market either since innovation in PVRs is happening monthly.

So what do we do? It will take the combined priority and resources of the right people in all of these organizations to put this feature on the fast track to deliver it to market in a year.

AOLTV and TiVo are in good position to deliver this very soon and MS needs to be a first mover if possible to get some momentum and own the mind share about this capability. AOL has just invested another $200 million into TiVo this past week for a total 30% stake; they are clearly moving down this path given their prior $200 million investment in TiVo in June of this year and their public announcements about remote email and recording programs on VCR. TiVo and Replay are both members (along with MS and others) of the TV Anytime forum, which is now just proposing remote programming and content referencing ID's. My guess is that something like it will appear very soon in AOL TV during 2001. If AOL succeeds in driving TiVo/PVR into their space, they could own the television platform given the kind of resources they would have to implement TokenTV functionality for Time Warner television shows and cable distribution.

If we lose this opportunity, we may lose a major opportunity to extend the PC's role into the broadcast television space as the hub information appliance that brings the power of the web, XML and extended Internet services to provide value for the consumer. We have to front burner this functionality and accelerate the announcement and rollout of Microsoft TokenTV now.

References

The New York Times Magazine

Cover Story

Sunday August 13,2000

Boom Box

The new technology from Tivo and replay provides the ultimate in television convenience. It will also spy on you, destroy prime time and shatter the power of the mass market.

By MICHAEL LEWIS Photographs by ALEXEI HAY

It is interesting how new technology arrives. On the one hand, there is something arbitrary about invention; on the other, every society seems to get the technology it deserves. Take ours, for example. The current phase of American capitalism began on Nov. 9, 1989, with the formal collapse of socialism. Suddenly, there was no need to flavor the free market with a dash of something else. The little pockets of socialism that had been tolerated when socialism posed a threat now, overnight, seemed horribly retrograde. Why have your capitalism diluted when you can have it straight? Since then, as if by some marvelous coincidence, a lot of new technology has arrived to enhance market forces. The Internet is one such technology. It creates new markets and new competition in old markets and helps to put a better price on everything. In a few short years, it has pretty much gutted the principles of corporate socialism -- jobs for life, employee and customer loyalty, all for one and one for all -- and replaced them with Lord knows what.

On any time line that describes this phase of American capitalism, you would have to include (in addition to Nov. 9, 1989) April 4, 1994 (birthday of Netscape), Nov. 10, 1994 (birthday of Amazon.com), May 5, 1996 (birthday of eBay) -- and Aug. 4, 1997. Aug. 4, 1997, was the beginning of the end of another socialistic force in American life: the mass market. Forty years from now when you have your grandson on your knee and he asks you, "Grandma, how did 50 million Americans ever let themselves be talked into buying the same mouthwash?" you will say, "Well, you have to know how things were before Aug. 4, 1997."

That was the day a pair of Silicon Valley engineers named Jim Barton and Mike Ramsay started their own technology company. They had no idea what that company might do. It didn't matter: all over Silicon Valley engineers were founding companies before they had any idea of what their companies might do; the urge to innovate preceded the innovation. The Internet had created a climate of entrepreneurship. It was assumed that even ordinarily smart engineers with the desire to create something new could do so with impunity, and Barton and Ramsay were more than ordinarily smart. They were so smart that a pair of venture capital firms -- New Enterprise Associates and Institutional Venture Partners -- advanced them several million dollars to get them started, few questions asked. "Three million dollars was pocket change," Ramsay explains.

Barton and Ramsay's first idea was to turn the American home into a network. Computer people have long imagined that the ordinary American home one day would be fully networked, leaving everyone else to wonder exactly what that means. Will the refrigerator order fresh milk directly from the grocery store? Will the furnace and the fish feeder and the vacuum cleaner respond to commands from the office desktop? Anything is possible. That was the good part about home networking as a business idea: the

Internet had made it feasible. The bad part about the idea was that it was hard to see the point of it. Oh, it was easy enough to get worked up about it with a fellow geek, but Ramsay and Barton discovered they couldn't explain their dream to anyone else. Ramsay puts it this way: "When you build a company around a technology and someone says, 'Tell me again what this thing does?' you need to be able to say, 'It does this.' We found that we couldn't say what home networking did."

And so, after a few months, they abandoned home networking. They went back to their venture capitalists and told them that home networking was a bad idea because they couldn't explain it to anyone but other geeks. They had another idea, though. Instead of transforming the entire American home, they decided to focus on the one appliance that was the closest thing to the center of attention in the American home: the television.

Barton had become obsessed with the television a few years earlier, when he worked at what was then the hottest computer company in Silicon Valley, Silicon Graphics. In the early 1990's, Time Warner, AT&T, Microsoft, Silicon Graphics and other big technology and media companies fell in love with the same idea: that they could change the way Americans watched television. A new device -- variously known as the telecomputer, interactive television or the black box -- could be plonked down on top of the American television to offer the viewer an entirely new experience, one in which he would be able to e-mail, shop and access a virtual library of movies from his couch. There ensued a mad scramble, and Barton was a part of it. He helped to build the only interactive television that actually worked, installed in late 1994 by Time Warner in 4,000 homes in Orlando, Fla., and then watched in dismay as his beloved project was overrun by the Internet. The Internet did a fraction of what the new TV's promised, but at a fraction of the price.

Of the few people who dwelled on the way the Internet had swamped interactive television, Barton may have dwelled on it the most. Like a lot of really smart engineers, Barton has the air of a man used to figuring things out. Ask him a question, and a little smile and just a hint of self-satisfaction flickers beneath his light brown mustache and reminds you, gently, that he knows a lot more than the answer. But the TV gnawed at him precisely because he didn't have the answer. He had sunk the better part of three years into building Silicon Graphics' interactive television, and it had been a commercial disaster. The box worked. And yet no one cared. There were several lessons in this:

No. 1: Brilliant gadgets for a mass market do not go anywhere if the masses cannot afford them.

No. 2: A big company is not necessarily the best place to create a revolutionary technology.

No. 3: The whims of the American consumer are the eighth wonder of the world. They can wreak havoc with the most powerful establishments.

When Barton and Ramsay returned to the television, they had in mind another black box, at once more and less ambitious than the interactive television. They called it a personal television receiver, but never mind about that. It was a black box. The main thing about the black box was that it had a memory. It could record any program as it was watched, as well as anything its owner instructed it to record. This is, of course, what VCR's were designed to do but didn't, since no American, not even a geek, could figure out how to make them work. The new box would be simple to program. It was a VCR that did what it was supposed to do, even if you were a moron. But it was far more versatile than that. The viewer could record a great many hours of programming. Or he could simply tell the box to go out and find him the kind of programs he liked. If he liked indiscreet women, he could record and store every episode of "Sex and the City." If he liked intelligent blood and guts, he didn't need to wait until TNT's Clint Eastwood week -- he could just instruct his black box to fetch Clint Eastwood movies as they played. Once the box was up and running, the viewer's only constraint on choice was that the program had to be broadcast by someone, sometime.

The black box also enabled the viewer to treat all television -- even live television -- as television he had recorded for his own private use. All he would need to do is start

watching a program a few minutes after it began. Then, by pressing a button, he could skip the credits, the huddles, the timeouts, the weather, the endless clicking of the "60 Minutes" stopwatch and all the other boring stretches of television designed by producers to lull the viewers into watching ads. He could also skip the ads.

Over time, the viewer would create, in essence, his own private television channel, stored on a hard drive in the black box, tailored with great precision to his interests. His ability to do this would depend on the amount of computer memory in this box. At the start, Barton reckoned, a black box that cost $1,499 would be able to store about 28 hours of programming; one that cost $699 would be good for six hours. But with the price of computer memory falling by half every 18 months, the price of the box would plummet: in less than a decade, a black box costing no more than $100 would be able to store the equivalent of an entire Blockbuster Video outlet.

There was one other cool thing that the black box did -- though Barton didn't dwell on it much at first. While the viewer watched the television, the box would watch the viewer. It would record the owner's viewing habits in a way that TV viewing habits had never been recorded. The viewer's every decision would be stored in a kind of private museum of whims. Over time, the box would come to know what the viewer liked maybe even better than the viewer himself. All by itself, it would go and record shows that it calculated the viewer might like to watch. The box was more than a box, it was a butler, and the more it learned about its master's whims, the more it would be able to fetch what its master wanted.

The box had certain advantages over every other attempt to transform the television -- and there had been many. One was its phenomenal simplicity. Unlike, say, the VCR, it required almost no technical aptitude. The black box would turn the television into a computer but without making any computerlike demands on the viewer: all the consumer would see was a slightly busier remote control. Another advantage was price. A revised final advantage was that you could explain it all to an ordinary human being. When someone asked Barton or Ramsay, "Tell me again what this gadget does?" they now had a simple answer: "It lets you watch anything you want to watch when you want to watch it."

Ramsay and Barton decided that in spite of appearances, TiVo, which is what they decided to call their new company, was not a maker of black boxes but a service for people who owned black boxes. TiVo would help each and every American to create his own private television channel. Of course, in the beginning, they would need to build the black box and sell it to the masses. But the black box was not where the money was -- the box was, in fact, a big money loser. To kick-start the market, Ramsay, 50, now C.E.O., and Barton, 42, the chief technology officer, would need to pay some consumer electronics company like Sony or Philips to manufacture the black boxes and to sell them below cost. The trick was to get as many black boxes into the American home as possible. Once the new boxes were proved to delight their audience, TiVo would then offer its services to the masses: the company's programming software would be in millions of new homes either in tandem with existing cable boxes or, in the future, embedded in new TV sets, cable boxes or satellite receivers made by companies like Sony or Philips. Thus, the long-term goal of the black box was to become unnecessary. "We'll know we've succeeded when the TiVo box vanishes," Barton says.

The ambition of the thing was breathtaking. The company intended to plop itself down between the 102 million homes with televisions and the $50 billion TV industry. Once the box was in place, TiVo would be the hub of the television industry. The company would come to know the subtle preferences of each and every television viewer. It would then be able to charge a fee to anyone who wanted to locate TV viewers or groups of viewers: networks, cable companies, advertisers. The trick was to get the box into those 102 million homes -- and that would cost money. Lots. Ramsay went back to the venture capitalists and told them that he and Barton needed to lose between $300 million and $400 million before they became profitable. Prior to the Internet boom, the capitalists were chary about sinking one-tenth of that sum into a small, risky venture; now they

didn't think twice. "Instead of saying, 'No,"' says Ramsay, "they said, 'Great."'

What made the enthusiasm of TiVo's financial backers even more astonishing was that a rival company had already sprung up. Anthony Wood, a young entrepreneur, stumbled on the same idea as Barton and Ramsay at roughly the same time. Wood, who made a lot of money in computer games, had been frustrated by his inability to persuade his VCR to record episodes of his favorite show, "Star Trek." He saw the same big trends that had lighted a fire under Barton and Ramsay: the falling price of computer memory, the TV viewer's desire for choice, the continued inability of Americans to program their VCR's. In early 1998, not long after Barton and Ramsay got their first financing, Wood generously agreed to accept $8 million from the venture capitalists Kleiner Perkins Caufield & Byers and Paul Allen's Vulcan Ventures. He called his new company Replay Networks.

Another mad scramble to transform the television was under way, but this time it was more attuned to the spirit of the marketplace -- the approach came from the bottom up rather than from the top down. "This is the Trojan horse for the computer industry to gain control of the entertainment industry," says Marc Andreessen, a Netscape co-founder who invested his own money in Replay. "It is the first box built by Silicon Valley that is compelling enough that people want to hook it up to their TV sets."

The new companies were proposing to do politely to the television industry what Napster was about to do to the music industry: help consumers to help themselves to entertainment without "paying" the networks and advertisers. Naturally, this disturbed the television networks and advertisers. This winter, Stacy Jolna, TiVo's liaison with the networks, appeared on a panel before the National Association of Broadcasters. Jon Mandel, an ad executive with MediaCom, was also on the panel. "He started by calling me and everyone involved with this technology 'the devil incarnate,"' Jolna says. "And he went on from there. The basic attitude of TV executives was that we were somehow going to destroy a $50 billion business model."

By March 1999, the first TiVo and Replay boxes had already shipped. By the beginning of this summer, several hundred thousand more boxes had been rolled out. A Replay box with 30 hours of storage cost $499. A TiVo box with 30 hours of storage cost $399 -- but then the company generally charges a subscription fee of $9.95 a month. Until this June, the companies had sold about 100,000 boxes between them, and they had done so largely without advertising their products. Several market analysts estimate that TiVo and Replay will have sold five to seven million boxes by the end of 2002 -- and that within a decade they will be in 90 million U.S. homes. But that's just guessing. No one knows how quickly the companies can arm the entire American population, or even if they will do so. The black box is not, like the VCR, a winner-take-all market. There is room for a lot of different companies to sell the same seditious technology and to coexist happily with one another. They're seizing control of a $50 billion industry from its creators; there's more than enough booty to go around.

"The one question our investors did ask us," Ramsay says, "is 'How long will it take for the TV networks to hate you so much that they shut you down?"'

Talk to enough people at TiVo and Replay and pester enough people at the networks and the big advertising firms, and you come to realize that they have two stories to tell: an official story and a true story. The official story is believed by practically no one, not even journalists. It's pure ritual, made necessary by the desire of everyone concerned not to dwell on the violence about to occur in a huge industry. The official story is that these new black boxes won't destroy the television industry as we know it; they'll merely enable its current rulers to make it an even better place.

Right from the start, TiVo set out to persuade the networks of this pleasant notion in the hope of avoiding lawsuits. To do this, they had to play down a lot of what made their box desirable to a consumer. Instead of a button that enables the viewer explicitly to skip commercials, for instance, Barton designed one fast-forward button with three speeds, which might be called fast forward, faster forward and faster-faster forward. The TiVo

user is able to speed through the commercials but not skip them entirely: the ad still makes some sort of blurry impression on the viewer. "Network psychology is to have a line in the sand mentality," says Ramsay. "If you're on one side of the line, you're their friend. If you're on the other side of the line, you're their enemy. Advertising the ability to skip commercials is on the other side of the line. We designed the technology so that it doesn't infuriate the networks."

Eighty-eight percent -- 88 percent! -- of the advertisements in the TV programs seen by viewers on their black boxes went unwatched. If no one watches commercials, then there is no commercial television.

Replay Networks, now called ReplayTV, at first took the position that the networks' interests were irrelevant. What the American consumer wanted, the American consumer eventually got, and so you might as well give it to him right away. Replay's remote control has a button marked "QuickSkip," which lets the viewer leap ahead in increments of 30 seconds, the length of a typical TV commercial. The owner of the Replay box is thus the open adversary of the television establishment. "I spent a lot of the first year getting thrown out of meetings at networks," Anthony Wood admits. Then came a change of the Replay heart, when Wood was replaced as C.E.O. by Kim LeMasters, the former president of CBS Entertainment, who saw the point of network support. LeMasters struck a much more conciliatory note. Though he wasn't able to scrap QuickSkip, he let it be known that he would not promote the feature. "The Replay device doesn't do any good if it doesn't have anything to broadcast," he says.

And so now the two companies are in roughly the same position of arguing to the networks that a device that steals their power and hands it to consumers is actually good for them. They offer two points to support the case. The first is that the television viewer is too inert for the television to change. Several times since the first commercial broadcast in 1939, a new accessory has appeared that promised a revolution -- the VCR, the remote control, cable TV -- only to be assimilated without greatly disrupting the existing social order.

The VCR proved too unwieldy to be used for anything but rented videos. The remote control enabled people to surf but not so much that they spooked Procter & Gamble and General Motors and the rest. Cable TV fractured the mass audience into slightly smaller pieces, but again, without a huge effect on the economics of the business. True, the big three networks had 91 percent of the viewing audience in 1978 and only 45 percent in 1999. But it is also true that of the $45 billion of television advertising in 1999, $14 billion went to CBS, ABC and NBC, which is $10 billion more than they collected in 1978. (Advertisers have, until now, been willing to pay the networks more for less. It's as if what matters to them is not the absolute size of an audience but the relative one, and the three major networks still offer them the biggest.)

The other point is that by making television more appealing, the black box encourages people to watch even more of it. This prospect may cast doubts on the future of intelligent life, but it should, in theory, be good for TV networks. Replay now has actual data to prove that its new customers watch, on average, three hours more television each week than they did before they got the box. "Yes, we're messing with your business," they argue to the networks. "But in the end, you'll love us for it because three more hours a week means billions for you in additional advertising revenues." Marc Andreessen, for one, believes this argument is persuasive to networks. "They want to believe it because they are seeing data for the first time that shows young people are watching less and less TV and spending that time on the Internet."

That's the official story. It's the story that enables TiVo and Replay employees to interact pleasantly with network and advertising executives. But as I say, no one could possibly believe it, and it becomes less plausible every day thanks to the information piling up inside TiVo and Replay about how ordinary people use their new black boxes. They use them to undermine, with ruthless precision, the interests of TV networks and mass-market advertisers. The owners of the 100,000 or so black boxes that have already been

installed have two distinctly unsettling new habits. The first is that they don't watch scheduled TV anymore. According to Josh Bernoff, a television industry analyst with Forrester Research in Cambridge, Mass., who closely follows both the black-box companies, viewers "get into the habit of not paying attention to when the programs are on and just watch what they've recorded."

Well. If it doesn't matter when programs run, then the whole concept of prime time vanishes, and with it the network's ability to attract an audience for a new show simply by broadcasting it when people have the tube switched on. With it, also, goes the special market value of prime time -- though the market value of other broadcast space rises. Ditto the idea of pitting one show against another by virtue of its time slot. In the age of black boxes, every show ever broadcast competes against every other show for the viewer's attention; for this reason, whatever advantage a network has in the development of new TV shows disappears.

But that isn't the worst news that TiVo and Replay have for the television networks. The worst news is that no one watches commercials anymore. Eighty-eight percent -- 88 percent! -- of the advertisements in the programs seen by viewers on their black boxes went unwatched. If no one watches commercials, then there is no commercial television.

And yet -- and here is the punch line -- the major broadcast networks have done nothing but encourage the new technology. In August 1999, Time Warner, Disney and NBC, among others, sank $57 million into Replay. About the same time, NBC and CBS, among others, handed $45 million to TiVo. By the end of 1999, all three major television networks, along with most of the major Hollywood studios, the two biggest Hollywood talent agencies (I.C.M. and C.A.A.) and all the major cable and satellite TV companies, had either made investments or formed partnerships with both Replay and TiVo.

There are a lot of explanations for why the networks have rushed to embrace their own creative destruction, most of them premised on the idiocy of network executives. Only one of these explanations is plausible: they feel they have no choice. "If the networks could roll back the clock and prevent digital technology from ever happening, they'd do it," says LeMasters of Replay. "But how do you stop progress? We're offering them the chance to adapt." Tom Rogers, the former president of NBC's cable division who made the first network investment in TiVo and Replay, puts it this way: "We thought that the technology was going to come, and it was better to have some voice in shaping it than none." It was the promise of NBC's imprimatur, in fact, that caused TiVo to design its remote control without what Rogers calls "the ad zapper." By the time Replay decided that it might be useful to have the endorsement and money of the networks, the company was too far along to eliminate QuickSkip, its ad zapper. NBC gave Replay money anyway. "We couldn't be in a position of being seen to promote a technology that was intended to undermine the economic support of the industry," says Rogers, explaining the quiet promise not to market the feature to consumers. That was in late 1998. Since then, Rogers has left NBC to become chairman of Primemedia, a holding company for lots of little niche media. Today, Replay markets its ad zapper. And one of TiVo's new advertisements features a network executive being hurled out a window by a pair of goons.

Their indiscriminate hurling of money at both TiVo and Replay suggests that the networks understand that the companies trying to commercialize the technology are, in a way, irrelevant. (Why not just back the one who promises to be less hostile?) It's the technology that matters; and it's the technology that is sure to win. "A lot of these guys had their bell rung four years ago by the Internet," says Steve Shannon of Replay, "and they don't want to be humiliated a second time." The Internet gave birth to a new corporate religion to replace the one it killed. The religion says: change is inevitable. The question now being posed by the television establishment -- and it emerges from the belly of the beast as a weak burp rather than a loud blast -- is no longer, "Is this new gadget going to affect us?" or even "Will this gadget eventually change how Americans watch TV?" but "When this gadget changes how Americans watch television, what else will it change?"

A lot.

the black box obviously does not mean the end of commercial television, only of commercial television as we know it. It poses two questions that demand a response from the television industry. The first is: How do you get people to watch ads when, with the press of a button, they can eliminate them? The sad truth about most popular TV programs is that they are poor vehicles for delivering advertising messages. And the sad truth about ads -- even the ones that cost $3 million to make and win the Golden Lion at Cannes -- is that the people who watch them really didn't ask to see them; people are just too lazy to avoid them. The black box puts an end to that racket. Either the ads will need to become as entertaining as the programs or the programs will need to contain the ads, so that they cannot be stripped out. If Jennifer Aniston wants to remain a Friend, she may need to don a T-shirt that says "Diet Coke."

The basic formula for making and selling TV programs hasn't changed since the beginning of commercial television. The network that develops a new program assumes it can ensure its success by placing it in a desirable time slot, when a lot of people happen to be watching TV. It further assumes that it can pay for it by selling commercial time during that program. The commercials then get flung at whoever happens to be watching at the time. The entire history of commercial television suddenly appears to have been a Stalinist plot erected, as it has been, on force from above rather than choice from below. The networks have coerced, or attempted to coerce, consumers to watch programs and commercials in which they have no native interest. The advertisers who pay for the commercials have agreed to believe, without good evidence, that some meaningful percentage of viewers actually behave in this manner. They have further agreed to believe, again without good evidence, that the sort of people who watch a particular program have a more than ordinary interest in the products advertised on that program. People who enjoy pro basketball are more likely than people who watch soap operas to drink beer; therefore beer companies buy ad time in the middle of pro basketball games.

Against the backdrop of the Internet boom this strikes the newer sparks of the ad and marketing business as terribly retro. "The television advertising business," says Tim Hanlon, a media director at Starcom Worldwide, a large advertising and marketing conglomerate, "is a science based on specious data." That data, generated by Nielsen Media Research, uses a sample of 5,000 homes to determine how many households tune into a given program, not how many watch the ads. "The measurement we use today is very crude," says Daryl Simm, the former head of worldwide media and programming for Procter & Gamble and the current head of media at Omnicom, yet another large advertising and marketing conglomerate. "It's an average measurement of the number of viewers watching an individual program that does not even measure the commercial break. When you think about improvements in measuring viewer habits, you think not about incremental changes but great leaps."

The TiVo and Replay boxes represent the greatest leap of all. They accumulate, in atomic detail, a record of who watched what and when they watched it. Put the box in all 102 million American homes, and you get a pointillist portrait of the entire American television audience. And that raises the second and more disturbing question to which the TV industry must respond: what do you do when you actually know who is watching and why? Already, TiVo and Replay know what each of their users does every second, though both companies make a point of saying that they don't actually dig into the data to find out who did what, that they only use it in the aggregate. Whatever. They know.

More to the point, they will know, in great detail, the viewer's interests, as recorded by the black box. Even now, advertisers pay a lot more for a well-targeted ad than they do for the sort of near-blind matchmaking that the networks, historically, have made their chief business. Put another way, an audience of 200,000 people you know intimately might be as valuable as an amorphous mass of 20 million. After all, a person with a deep interest in a subject is more likely to watch an ad about that subject. "You and I may not care to watch a commercial for Preparation H," Josh Bernoff says. "But for someone with hemorrhoids, it might be the thing he is most eager to hear about. And he's the one the

makers of Preparation H want to talk to."

This is the market promise of the new black box. It can extract far more profit from every viewing minute of American television by creating endless clusters of new and very valuable groups of people with some common intense commercially exploitable interest. "This technology will encourage all sorts of niche brands," says Jim Barton of TiVo, "as well as whole new markets." His favorite example is the field-hockey channel. Everyone in the world with an interest in field hockey can punch "field hockey" into their box, and the box will go and find and record any program having to do with field hockey. At the moment, there isn't much field hockey out there on the tube; that will change. The maker of the new field-hockey related shows will rent cheap time -- at, say, 4 a.m. -- to broadcast. Field-hockey enthusiasts will simply record the shows. And -- voil -- a new business is born. "The business is two guys," Barton says. "One of the guys goes out and acquires field-hockey content. The other guy calls people who make field-hockey equipment."

The economics of targeted ads is so compelling that to make them possible is to make them certain. The formula for a field-hockey channel that sells only field-hockey equipment or a hemorrhoid channel that sells only hemorrhoid treatments is endlessly reproducible. But the same slice-'em-and-dice-'em logic applies even to such seemingly mass market events as the Super Bowl and the Academy Awards. The broadcaster that owns the rights to a mass-market event will be under tremendous pressure to carve the audience up into little pieces and to sell each piece to the highest bidder. Once the black box is ubiquitous, an advertiser need not buy the whole audience; he can buy a piece of the audience. Of course, General Motors may still buy time during the Super Bowl -- and pay a lot more for it. The company will probably use the time differently, though. In a world filled with black boxes, G.M. might use its 30 seconds to distribute 50 different commercials to 50 different clusters of consumers. New mothers will see ads for S.U.V.'s, middle-age people will see ads for sports cars and so on, and all the little groups will have been identified for G.M. by the new black box.

But even that is a retrograde example. The operative unit in TV ratings will no longer be the program but the moment. Advertisers and networks will know with weird accuracy who and what within each program best holds television viewers' attention. The black box can determine which joke in Letterman's monologue prompted certain viewers to switch to Leno or which medical emergency inspired viewers to exit "E.R." (If you thought the pressure on entertainers to be perpetually entertaining couldn't increase, think again.)

Many things will change when television is able to whisper finely tuned messages to like-minded consumers rather than hollering crude messages through a bullhorn at millions. One thing that will change is the price of the messages. If they are to become more valuable, the targets must shrink, and as the targets shrink, the tools used to hit them must shrink as well. Not even General Motors can spend $3 million on an ad that will only be seen by 40,000 people. "We sort of see this as the changing of television as a medium," says Hanlon of Starcom. "I know the creative side of our business truly hasn't gotten this yet; they still see it as a fringe technology. But they are the ones who will get steamrolled first and most cleanly."

The people who use the bullhorn are also in trouble. Mike Ramsay recalls how in late 1997, just after TiVo opened its doors, he received a call out of the blue from Procter & Gamble's research division. Along with General Motors, P.&G. is the largest buyer of television time in the United States; between them, the two companies ponied up $3 billion of the $45 billion spent last year on television ads. "These two guys from P.&G. were in a car on a cell phone down the street," Ramsay says. "They were in the valley visiting and heard what we were doing and said they'd been playing with a similar idea in their labs because they knew that, sooner or later, something like this was going to happen. And they had the obvious question, 'How do we sell soap now?"'

In this new market, groups are narrower and defined by

interests, and the ultimate interest is . . . Me! The main thing about Me! is that he always gets what he wants, or at any rate what he thinks he wants.

The P.&G. research division believed that the inevitable collision of the computer and the television made it far less likely a) that people would gather in groups of millions to watch TV shows and b) that people would watch ads that were thrust on them unbidden. But in P.&G.'s view, this was not necessarily a bad thing. "I'm really intrigued by this notion that the viewer now will be more dedicated," says Simm, who ran P.&G.'s media. "He'll have a higher degree of interest in what he's watching because he has an investment -- he's gone to the trouble to capture the program. That investment is going to connect him to the viewing experience in a way that is stronger than just grazing around. Viewer loyalty has got to translate into advertising opportunities."

It does -- but for whom? It's one thing for the Internet to poach a bit of the American attention span from the television. It's another to transform the television into an Internet-like renegade force for individualism. The television is the mass market. Without the television, there never would have been Tide or Rice Krispies or Alpo but a thousand versions of Tide and Rice Krispies and Alpo. This may not seem like a big deal to a user of Tide or Rice Krispies or Alpo, but to a manufacturer of Tide or Rice Krispies or Alpo it matters very much indeed. For the big brands, life without television is no life at all. Giant corporations whose sole purpose is to mass-market consumer goods exist in their current form because the television shaped the mass market. If television ceases to be a mass market, the mass market largely ceases to exist. The question isn't, "How does P.&G. sell soap?" but "How does P.&G. survive?" It must transform itself from a maker of mass-market goods into the world's largest boutique. After all, the consumer would obviously prefer not only the message precisely tailored to him but the products as well. In this new market, there will either be hundreds of versions of Tide or no Tide at all.

But why stop there? It isn't just the mass market that is crude and inefficient and therefore ripe for re-evaluation; it is Market Man himself. The new technology enables the market to redefine the consumer along significantly different lines. Instead of grouping him according to observable traits over which he has little or no control -- age, race, gender and so on -- the new market will know him by the decisions he has made about how to spend his time, each and every moment of which is recorded by his black box.

Nick Donatiello, the head of a San Francisco market-research company called Odyssey, says that the black box -- along with related technologies like the Internet -- makes it likely that ads will be tailored not to outward characteristics but to the more fundamental attitudes of the consumer. General Motors will run one commercial, perhaps, for people with a tragic view of life and another for people with a comic view of life. "Demographics used to be a good proxy for attitudes," Donatiello says. "In the 50's, you could tell a lot of things about a person if you knew where he lived. You can't do that anymore. We've become too fragmented and autonomous a society."

The process of getting inside a consumer's mind so that you can then get inside his wallet sounds invasive, and perhaps it is. But it's nothing personal. TiVo or Replay or some black-box service company will be able to present some mass-market company trying desperately to stay alive with 40,000 consumers classified as People Who Live for Onions. The individual consumer need never be mentioned by name or separated from his discrete group of onion obsessives -- at least not yet. Permitting himself to be classified with ever more intrusive precision is the price the onion obsessive pays for getting his onions. He may still not like the way the market classifies him, but this time he has no one to blame but himself. In that sense, it's rather heartening.

But what happens to people when the market view of them is different from the one they have of themselves? Do they come to see themselves as the market sees them? Do they feel more "29-45" or "male" or "Hispanic" because the incoming commercial signals are aimed at these specific traits? Will they come to think of themselves not as white or young or female but as Positivists or Relativists or whatever other types get dreamed up

in response to the data generated by the black boxes? Stuff like this happens in America. One paradox of Generation X is that it viewed itself as ironically detached from the marketplace, when in fact it was itself created by the market. It grew out of MTV, which came into being because advertisers found it handy to have young people stripped out from the rest of us so they might be more accurately targeted.

It's a little strange to think of the mass market as a collective, but that is what it is. People who watch commercials subsidize people who don't; people directly influenced by ads subsidize people who watch ads with ironic detachment. This little pocket of socialism came into being at least in part because the technology did not exist that could measure, and put a price on, the attention of individual consumers. The mass market put a price not on individual states of mind but on the average state of mind of commercially very different people. It did this because it made no economic sense to parse in microscopic detail what each and every one of us did with our attention and why we did it. And so the market just lumped us together and assumed we all paid more or less the same attention.

Now, suddenly, the technology has appeared that can unravel the collective. That it arrives at a moment when all forms of socialism are on the run is either a magnificent stroke of luck or a good example of a society getting the technology it deserves. The only question is how far its logic will be taken -- to what level of detail will the consumer's state of mind be measured and priced?

But that makes it sound as if it is all some sort of elaborate conspiracy, beyond anyone's control. There is a pitiless economic process at work, so gradual that it does not really ever demand to be noticed. It is a species of economic determinism, the reverse of the one Marx described. The means of consumption, not the means of production, are the engine of modern economic life. The consumer's neurons will be measured and priced only if the consumer wants his neurons to be measured and priced, because their precise measurement enables others to give him exactly what he wants. If this is a conspiracy, it's a whole new kind of conspiracy. The consumer must conspire against himself.

Maybe the best way to see what's about to happen to the mass market is to observe what has happened already. To some extent, for instance, ads have become more like entertainment, and TV programming has moved in the direction in which it is about to be shoved much, much further. The few events that really benefit from being watched live -- sports and awards and sensational unfolding news -- have a greater gravitational pull, and a greater market value, than ever. Synthetic events like "Who Wants to Be a Millionaire" and "Survivor" are prescient, for they involve the viewer as a quasi participant and require the actual participants to deploy many vendable goods, thereby offering sparkling opportunities for product placement. In a "real" world, real goods and services are more naturally introduced than in a purely fictional one.

The new black box is really just a fantastically powerful accelerator of the fragmentation of markets that has occurred in response to cable television and the Internet. The Internet has paved the commercial imagination; everyone understands that something like the new black box is bound to happen to television. Already there's some rumbling in the netherworld of advertising and marketing that suggests it is preparing itself for the coming earthquake. For instance, last fall Starcom began to classify television audiences not by demographics but by something it calls "passion groups," which are defined by shared interests. Odyssey shuns demographics and instead categorizes consumers along the lines of their fundamental attitudes, giving them funny names like New Enthusiasts and Old Liners. Procter & Gamble has created a Web site called Reflect.com that enables shoppers to create their own beauty products -- a harbinger of an age in which every consumer will feel free to demand products tailored to him and him alone.

The theme of all this -- and much of what is new in the market -- is that groups are narrower and defined by interests and that the ultimate interest is . . . Me! The main thing about Me! is that he always gets what he wants, or at any rate what he thinks he wants. The mass-market consumer was a character who subjected himself to some form of coercion. The unmassed consumer needs to want to be sold.

When a persuasive new technology appears, it is only natural to wonder what effect it might have on the world around it. But it is also worth putting the question the other way around: what effect does the world around it have on technology? That is, what kind of society gives birth to such a gadget? Nick Donatiello makes the point that the black box is ideally suited for American life as it is currently configured, when consumer choice has been exalted to a fetish. "If you had offered Americans this box 30 years ago," he says, "they wouldn't have had the same reaction. One of the reasons people used to watch TV in the 1950's and 60's was for the shared experience. The metaphor for the country was the melting pot: people wanted to be the same. People read Time and Newsweek mainly because other people read Time and Newsweek. Now the metaphor is the quilt."

This is another way of saying that a technology that was shaped by one kind of society is being forced to adapt to a new kind of society. Most of the changes the black box so grandly encourages are merely extensions of trends under way: decentralization, free agency, the rooting out of all kinds of antimarket behavior and so on. Even the birth of the black box itself -- brought about as it was by obscure entrepreneurs working with venture capital instead of big companies trying to impose change from the top down -- was, as the market analysts are fond of saying, on trend. The tail now wags the dog.

MyReplayTV™ Creates First-Ever Online Portal to Personal TV Service; Gives Viewers Whole New Way To Interact With Programming, Information

ReplayTV Service Customers Can Soon Control All ReplayTV PVRs From Anywhere

MOUNTAIN VIEW, CALIF. –August 9, 2000 –ReplayTV, Inc. today announced MyReplayTV, a revolutionary feature creating an entirely new way for people to interact with television programming and related information. MyReplayTV creates for the first time, a web portal where viewers can find out about TV programming, gather additional information about shows of interest and control the ReplayTV Service and digital video recorder via the web. Calling the first phase "the ultimate remote control," the company said the fall release of the service is a major step in creating an interactive environment where information is shared between the Internet and the home audio-visual environment.

With MyReplayTV (www.myreplaytv.com), customers using a personal computer can control any digital video recorder powered by the ReplayTV Service from anywhere in the world. Whether at the office or the airport, they can log onto the web site, view their personal ReplayTV channel guide to find shows and set-up recording options just as easily as if they were at home on the couch. They can also search for shows, actors, directors, themes or movies simply by typing in names. MyReplayTV gives people more convenience, choice and control in their television viewing even when they are away from home, further assuring they won't miss their favorite shows.

"As an addition to our award winning free service, MyReplayTV will allow our customers to control their ReplayTV PVR from anywhere in the world via the Internet. As an example, a ReplayTV owner who lives in California and is on a business trip in New York can take advantage of the ReplayTV Service right from a hotel room," said Kim LeMasters, ReplayTV, Inc. chairman and CEO. "The future of MyReplayTV is as a conduit for the rapid introduction of valuable new services that combine the best elements of the Internet and television. It means that all things are now possible when it comes to recording shows, finding and collecting related information and leveraging content between the Internet and television. As an example of future capabilities being considered, viewers who watch NBC-TV's "The West Wing" could have related information and web content on U.S. Presidents, the White House or other topics made available to them through MyReplayTV.

According to LeMasters, the first release of MyReplayTV will be available in conjunction with a new ReplayTV Service software update later this year. The first phase will allow users to view program listings and personal channels, search for shows, set-up recordings, view the amount of storage space available on the hard disk and even view recording status messages. As part of ReplayTV's ongoing commitment to improving their free Personal Television Service, MyReplayTV will be made available to all existing users via a software download to the installed base.

"In the future, as a fully reciprocal environment, MyReplayTV will allow our users to personalize and view information such as television news and related online data at a single, easy-to-use place. As an example, through MyReplayTV users could set-up a New York Yankees 'virtual channel' where all games, post-game shows and news coverage would be automatically recorded on their home PVR, and all online news, schedules, statistics and merchandise would be automatically available online," LeMasters said.

According to a leading industry analyst, MyReplayTV presents significant opportunities for TV networks, studios, programmers and advertisers. "This online portal offers a brand new way to promote their programming and related content to a highly prized, affluent consumer base at a specific point of interest," said Larry Gerbrandt, senior analyst at Paul Kagan Associates, Inc., an independent media research and consulting firm. "This is another example of the ways personal TV technology can empower the TV viewer and add a level of interactivity which molds the TV experience to the modern American lifestyle."

With ReplayTV, viewers can pause, instant replay, rewind, quick-skip, frame advance and watch in slow motion their favorite sports events and TV shows. With the ReplayTV personal television technology and the free ReplayTV Service, viewers don't have to miss their favorite programs because ReplayTV automatically searches, finds and records them for playback at anytime. Viewers can also create personal channels based on themes or shows. Viewers can watch the most current episodes of their favorite shows at their convenience on their own schedule with ReplayTV.

Pricing and Availability

With prices starting at $499 and storage capacities up to 30 hours, the ReplayTV ShowStopper from Panasonic is available in consumer electronics retailers nationwide including Best Buy, Circuit City and Sears stores.

ReplayTV's fast-forward remote control

Users ought to be able to program Internet appliances online. ReplayTV's latest feature is a sign that manufacturers "get" the Net.

By *Richard Shim*, ZDNet News
August 9, 2000 2:19 PM PT

ReplayTV on Wednesday announced a new feature that will let subscribers to its digital video recording service remotely program their devices with a Web browser.

Dataquest senior analyst P.J. McNealy said the free service, scheduled for release in the fall, is a sign that consumer electronics manufacturers are beginning to "get" the Web.

"Before, manufacturers were adding the Web as a feature because everyone else was," McNealy said. "Now, they're figuring out how the Web will enable their services to be better."

- Called MyReplayTV, the new feature will operate like a remote control, allowing users to tell their recorders which programs to record and when.

It makes perfect sense, according to ReplayTV vice president Steve Shannon, who said users should be able to control an Internet appliance over the Internet.

"We see this as a key differentiator for our system and it will appeal to our tech-savvy audience," Shannon said.

Broader appeal

So far, ReplayTV has appealed to early adopters. But Shannon said the new feature was designed for a broader audience. It will seem familiar to anyone who uses a Web browser.

McNealy expects the feature will become a standard for all digital video recorders. He predicted the next step would be for users to be able to use e-mail messages to program their devices.

Analysts have said that TiVo has a slight edge over ReplayTV in the race to dominate the digital video recorder industry. The winner will likely be the company with the most alliances with content providers.

Tivo, too

TiVo officials plan to release a similar feature next year as part of its larger Internet strategy.

"But modem-based systems now are too primitive. The core of our strategy will come out with larger bandwidth," said TiVO's Chief Technology Officer Jim Barton. Nevertheless, the company plans to provide services for modem users.

TiVo is also addressing issues ReplayTV has chosen to ignore, Barton said, citing privacy as an example. With information about users' programming tastes, advertisers could spam viewers. Barton said TiVo will also support the AOLTV platform in 2001, a strategic move he said would provide access to a large mainstream audience.

Starz Encore Group and TiVo Kick Off Integration of Subscription Video-On-Demand on the TiVo Service

Announce Details of Agreement To Offer Enhanced Personal TV(TM) Services in Broadband Environment

SAN JOSE, CA and ENGLEWOOD, CO, September 18, 2000 - Greg DePrez of Starz Encore Group LLC (Starz Encore) and Stacy Jolna of TiVo Inc. (NASDAQ: TIVO) announced today that the respective companies have signed a letter of intent to commence the joint development of subscription video-on-demand (S-VOD) and pay-per-view video-on- demand for broadband subscribers of TiVo's Personal TV(TM) services.

Starz Encore's subscription video-on-demand service enables the impulse viewing of Starz Encore movies with full "VCR" functionality for just a simple, flat monthly fee and will be fully integrated into the TiVo Personal TV service. This model is in contrast to the more traditional VOD requirement of ordering and paying for movies a la carte, whereby the consumer must navigate past multiple purchase steps and prerequisite transactional "speed bumps" before watching the selected movie programming. The Starz Encore movies offered every month for S-VOD viewing will be made available to consumers from a collection of the premier titles showing across the family of Starz Encore channels.

Arising from Starz Encore's 1999 private equity investment in TiVo, this strategic agreement will allow TiVo and Starz Encore to provide subscribers with instant, on-demand access to Starz Encore's industry-leading collection of commercial-free, uncut movies on the TiVo platform with VCR-like control. S-VOD will enhance TiVo and Starz Encore services in the cable, satellite, and telco broadband environments.

"Our announcement today is an endorsement of TiVo's dynamic personal video recorder (PVR) technology, its personal TV service, and the inherent appeal of subscription-based movie viewing in the broadband environment," said Greg DePrez, vice president, subscription video-on-demand for Starz Encore Group. "The broader partnership announced today highlights our commitment at Starz Encore to be at the forefront of TiVo's rollout in promoting our unsurpassed movie programming and the shared vision of improving movie enjoyment for our cable and satellite subscribers."

"I am pleased to welcome Starz Encore and its family of movie channels as a partner for the innovative S-VOD enhancement for our subscribers," said Stacy Jolna, vice president and chief programming officer, TiVo. "Movies are among our subscribers' favorite choices of programming. S-VOD technology will improve the value and appeal in our collective services. With TiVo and S-VOD, our subscribers can watch the widest selection of movies from Starz Encore on their own personal schedule."

DePrez continued, "Starz Encore is committed to enabling a subscription-based VOD offering for the consumer marketplace. "With the TiVo agreement, we have taken another significant step towards ensuring that one-way digital cable, satellite, and telco providers have the means to offer a compelling S-VOD product. Two-way digital cable is not a prerequisite for providing subscription video-on-demand."

About the TV Anytime Forum

The TV Anytime Forum is an association of organisations which seeks to develop specifications to enable audio-visual and other services based on mass-market high volume digital storage. The association comprises member organisations from Europe, the USA and Asia. Membership is open to all who sign the Memorandum of Understanding and attend meetings.

The Forum was formed at an inaugural meeting in Newport Beach, California from the 27 - 29 September 1999 and is now working to develop open specifications designed to allow Consumer Electronics Manufacturers, Content Creators, Telcos, Broadcasters and Service Providers to exploit high volume digital storage in consumer platforms.

Meetings are held at approximately two month intervals and, in December 1999, a Call For Contributions (CFC) was issued to draw requirements and technologies and increase participation in the creation of standards for Content Referencing, Metadata, and Rights Management. The Forum expects to publish its first specifications, covering Content Referencing in July 2000.

TV Anytime Membership

Membership is open to all who sign the Memorandum of Understanding and attend meeetings.

Signatories to the Memorandum of Understanding (at 18 September 2000)

- 4TV
- ABC Interactive
- ACI Worldwide BV
- Adherent Systems Ltd
- Antech SPA
- AnyTimeTV
- Applied Psychology Research Ltd
- ATI Technologies Inc
- Axcent Media
- BBC - British Broadcasting Corporation
- BSkyB - British Sky Broadcasting
- BT - British Telecommunications PLC
- C-Cube Microsystems
- Canal + Technologies
- Communication Arts
- Cylo
- Daewoo Electronics
- Danish Broadcasting Corporation
- Dentsu Inc.
- Digital Stream Technology Inc.
- Divicom
- DTI – UK Department of Trade and Industry
- EBU - European Broadcasting Union
- EDIT Technologies
- Elisa Communications Corporation
- EnReach Technology
- Equator Technologies, EU
- EuroCable Labs
- KPN
- LG Electronics
- Liberate Technologies
- LSI Logic
- Lysis SA
- MCS - Media Corporation of Singapore
- MediaGenix NV
- Mediasite
- Mediosystems
- Meijers Media
- Metabyte Networks Inc
- Microsoft
- Mindport Media4u
- Mitsubishi Electric Corporation
- NDS
- NEC Electronics UK
- NHK - Japan Broadcasting Corporation
- Nippon Television Network Corporation
- NOB
- Nokia
- Norpak Corporation
- NTT - Data Corp
- Oki Electric Industry Co.
- ONdigital - UK
- OpenTV
- Oxford Semiconductor Ltd
- Pace Micro Technology Plc
- Philips Consumer Electronics
- Pioneer

- ETRI - Electronics & Telecomm. Res. Inst.
- Exatel Visual Systems
- Fastcom Technology SA
- Finnish Broadcasting Company (YLE)
- For more convenient AV life
- Fox Entertainment Group
- France Telecom
- Fuji Television Network
- Fujitsu
- FutureTV
- Groupe TVA Inc.
- Grundig Fernseh & Video
- GTE labs
- Hewlett-Packard Company
- Hitachi
- Hitachi America Ltd
- Homing Inc
- Humax Co.
- IBM
- IMA Norway
- Information Broadcasting Laboratories Inc.
- Intracom SA
- IRT - Institut fuer Rundfunktechnik
- ITC - Independent Television Commission
- ITV - Independent Televison Network Ltd
- Jovio
- JVC - Victor Company of Japan
- Kargo
- Kick TV of Kick Communications Inc.
- Kinomai
- Quantum Corporation
- Random/Order
- Ravisen Technologies, Inc.
- ReplayTV
- RTE
- RTL Television
- Sagem
- Samsung Electronics
- Sanyo
- Screamingly Different Entertainment
- Sharp Laboratories of America
- Singularis SA
- Skytune
- Sonera
- Sony Corporation
- STMicroelectronics
- TAOJ - Telecommunications Advancement Organisation of Japan
- Telcordia Technologies
- Telematica Instituut
- Telenor R&D
- Temporal Research Ltd
- TeraLogic Inc.
- Thomson Multimedia
- TiVo
- Tokyo Electron Device Ltd
- Toshiba Corporation
- Tribune Media Services
- Triveni Digital, Inc
- UEC Technologies Pty, Ltd
- Vestel
- Videsti
- Waseda University
- Z Microsystems

TokenTV Patent Summaries

Section I. below provides a high level description of the patent specification that is used for each of the five patent applications, while section II. provides an overview of the general focus of the patent claims for the applications.

I. The Specification

As mentioned above, the specification describes the Token TV system and service from the client perspective, from the Token TV "clearing house" server perspective, and from a third party server perspective.

A. The Client - A client system associated with the user's recording device (e.g., a PVR) communicates with one or more servers to receive a message, such as in the form of an email. The message includes a "token" that includes programming criteria that corresponds to a given audio and/or visual program.

Once the token is received at the client, a token translation process may be required to provide sufficient programming information to the recording device. For example, the token that is originally received by the client system may uniquely describe a specific episode of Seinfield, but further information such as channel, time, and duration may be needed to record the program. This token translation may be performed at the client system if the user's local tuning space information is regularly provided to the client. Preferably, however, the client system transmits a token translation request to the Token TV clearing house server, which stores information about the user and his local tuning space. Using that information, the server performs the token translation and transmits the updated token to the client.

The client system may be configured to automatically program the recording device as the tokens are received. Alternatively, the client system may be configured such that the user manually selects which of the received tokens should be used to record content. Still further, the client system may be configured to receive tokens only from authorized sources.

The user's client system may also send tokens to other client systems (e.g., the user's friends). In response to receiving such a token, a given user may delete the token or forward it to his associated recording device. In this way, users of the Token TV service may easily share programming selections.

The client system also may be operatively associated with one or more of the user's remote computer devices, such as a PC, a PDA, wireless web phone, etc. Using the client system or any of his remote computer devices, the user may navigate the web to search for Token TV service programming content that he/she would like to record and forward received tokens to friends and family.

B. Token TV "Clearing House" Server and Third Party Servers

The Token TV system and service preferably includes a central "clearing house" server. Users preferably register with the Token TV service such that the server stores user IDs and local tuning space information. With this information, the server can receive token translation requests from user client systems, and transmit updated tokens specific to the users' respective local tuning spaces.

The clearing house server also preferably translates tokens received from participating third party servers. For example, PBS may have a web site that participates in the Token TV service system. A user may log onto the PBS website, and select a token representing a program that he would like to record. The PBS server would then preferably transmit the token and the user's ID (e.g., a Passport-like user ID) to the clearing house server. Using the user ID, the clearing house

server then translates the token to the user's local tuning space, and transmits the updated token to the user's client system/recording device.

The Token TV clearing house server and/or the third party servers may also offer subscription services to customers. For example, Roger Ebert might have his own web site that regularly selects programming that he believes the user would like to watch based on information earlier received by the user or based on the user's TV viewing habits. The Roger Ebert web site would then cause tokens to be sent to the user's client system/recording device.

In addition to the token translation process, the clearing house server collects viewing information that may be utilized to provide Neilson-like ratings, etc.

II. The Claims

A. Application No.149506.2

The claims of this application generally focus on the client/recording device system, and include system and method claims relating to programming of the recording device based on the remotely received tokens. Claims are also directed to the token translation process.

B. Application No. 150957.1

The claims of this application generally focus on the clearing house and third party servers, and include system and method claims relating to transmitting tokens; effecting programming of a recording device based on the tokens transmitted by the servers; the token translation process; and the interaction between the clearing house server and a third party server.

C. Application No. 150958.1

The claims of this application generally focus on the Token TV system as a whole, and include overall system claims and method claims directed towards the interaction between the client and the servers during program search/selection, token transmission, and token translation.

D. Application No. 155613.1 PC filtering EPG

The claims of this application focus on the interaction between the client and a server when a user is searching for a program that he would like to record, and the ensuing token generation and transmission process.

E. Application No. 155614.1

The claims of this application focus on the format of the token.