A TRIAL OF A NATIONAL PAY-PER-VIEW ORDERING AND BILLING SYSTEM

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ABSTRACT

A new concept in fully automated pay-per-view ordering and billing is presented. The system has the potential for nationwide scope, very high impulse capacity, and easy implementation by the cable operator. It would be simple and easy for the cable subscriber to use and would have low initial cost. It features a direct interface with the cable company's billing system so that all the elements of the pay-per-view transaction are handled in a fully integrated manner. A trial is planned in Milwaukee, Wisconsin starting in June, 1986.

INTRODUCTION

On December 5, 1985, AT&T, Showtime/The Movie Channel, Viacom Cable, and CableData announced they will participate jointly in a concept trial of an automated impulse pay-per-view ordering service that will allow cable television customers to order premium pay-per-view programming on a nationwide basis. The nine month trial is scheduled to begin in June, 1986 at a Viacom cable system in Milwaukee, Wisconsin.

There are four elements which must be performed in a successful impulse pay-per-view transaction:

1. Order Entry;
2. Event Scheduling (converter authorization/de-authorization);
3. Program Delivery;
4. Billing.

Because order entry is such an obvious problem, much attention has been focused on it, perhaps distracting attention from the other elements of the pay-per-view transaction. It is the goal of the Milwaukee trial to demonstrate a ***system*** in which all of the elements are handled in an integrated, fully-automated fashion and which is capable of accommodating a heavy volume of impulse orders. The system has the potential to be nationwide in scope, easily implemented by the cable operator, and cost-effective.

The order entry technology will be furnished by AT&T and will be based on an integration of three elements: AT&T 800 Service which allows consumers to place toll-free orders; mass announcement systems installed within the AT&T public switched network to enable quick verbal acknowledgement with very high capacity; and Automatic Number Identification (ANI) which captures the caller's telephone number and passes it to the order processing system. The order processing system will be provided by CableData and will feature an automated interface between the ANI data stream from the AT&T network and the CableData business system as well as an event scheduling and billing package. Viewer's Choice, Showtime's pay-per-view programming service, will provide programming via an encrypted national satellite feed. The combination of these components will form a complete end-to-end pay-per-view system.

This paper presents details of the Milwaukee trial, including a description of the entire transaction flow starting with the cable subscriber's telephone call and concluding with the receipt of an accurate, auditable bill.

WHY A NATIONAL SERVICE?

The Milwaukee trial will test a system concept with national scope. Specifically, the AT&T order entry technology is based on the nationwide AT&T public switched network which can be accessed from any telephone in the country including both rotary and Touchtone telephones. The ANI information is delivered to the cable company using standard communications protocols, and the programming is delivered by a national satellite feed. Why have the trial participants chosen this approach?

The authors believe strongly in the merits of a readily implemented, cost-effective, turnkey ordering system with national scope and very simple customer interface. Such a system could be sponsored by a national pay-per-view distributor such as Viewer's Choice and would have advantages of scale which can minimize the economic and opera-

tional hardship inflicted on any individual cable system that wishes to offer its subsribers pay-per-view programming. This arrangement would encourage the growth of the entire pay-per-view industry and benefit all industry participants including studios, programmers, cable operators, and vendors to the cable industry.

A national order entry system would help to build the pay-per-view audience more rapidly by making ordering simple, uniform, and widely understood by consumers. Furthermore, such a system would make it possible to utilize nationwide marketing techniques, which have lower costs per thousand and can be more directly integrated with the programming, but which are not useful when potential audiences are small. A standardized interface to the cable operator's business system would greatly reduce software development time and expense. In addition, since many business management systems already interface with the addressable controller, the time, cost, and difficulty of event scheduling should be reduced.

Many of these benefits would flow directly to the operator as reduced cost and difficulty. Others, like marketing efficiency and greater customer understanding and ease of use, should result in revenue increases from higher buying rates.

A streamlined national transaction management system would offer benefits not only to industry participants but also, equally importantly, to subscribers. Reduced cost and simplified ordering could support a healthy industry, capable of providing a diversity of pay-per-view programming in a cost-effective way to a substantial audience.

REQUIEMENTS OF A NATIONAL ORDERING SYSTEM

In the authors' view, a national pay-per-view order entry system must satisfy five general requirements:

1. Very High Impulse Capacity;
2. Simple And Easy To Use;
3. Economical With Low Initial Cost;
4. Direct Interface With The Cable Company's Billing Computer;
5. Turnkey The Cable Operator.

The rationale for these requirements is described below.

High Impulse Capacity. Market research has consistently shown and experience has proven that consumers wish to wait to order until the last moment before a show and will do so if left on their own. Indeed, for marketing reasons, this behavior is to be encouraged in order to benefit from impulsive consumer buying decisions. However, impulse buying makes extraordinary demands on the order entry system. A good system must have sufficient capacity to handle the traffic when all the orders for a routine movie arrive within the last few minutes before the movie begins.

Simple And Easy To Use. The consumer interface must be extremely simple, easy to understand, and natural to use. This, again, will allow consumers to make last minute buying decisions and then implement their decision without being inhibited, intimidated, or foiled by the ordering system.

Economical With Low Initial Costs. That the system must be economical should go without saying in a relatively low margin business such as pay-per-view. Moreover, a system with low initial cost will allow operators to experiment with pay-per-view with minimal risk.

Direct Interface With The Cable Company's Billing Computer. This is a requirement of an overall pay-per-view transaction processing system that is all too often ignored. In addition to enabling fully automated handling of pay-per-view transactions from beginning to end, it will allow sophisticated on-line error and validity checking that will maximize security and minimize customer service problems.

Turnkey To The Cable Operator. A standard overall system that can be simply installed and operated by the cable operator is extremely important. Not only will it encourage more rapid adoption of pay-per-view throughout the cable industry, it will also gain advantages of scale by allowing hardware and software development to be done once nationwide with concomitant cost economies.

CONCEPTUAL OUTLINE OF A NATIONAL ORDERING SYSTEM

Based on the above requirements, a national ordering system could take the following form:

1. The ordering system would be built around AT&T Advanced 800 Service. Each movie or event that may be ordered would be assigned a unique toll-free 800 number. To order, the customer would dial this number.

2. An automated acknowledging announcement would be given by a mass announcement node inside the AT&T public switched network so that massive impulse capacity could be available. No 800 service lines to the sponsor's premises — which have led to traffic choking and limited capacity in the past — would be required.

3. ANI would be delivered to a national pay-per-view distributor such as Viewer's Choice. Economic distribution of the ANI information to the cable operator could be handled via a data subchannel on the satellite feed.

4. Fully automatic processing, validation of the order, and activation of the addressable system could be achieved by interfacing the ANI data stream from the satellite receiver directly to the cable company's billing processor.

The start-up costs for a cable operator to offer pay-per-view with such a system would be minimal. There would be no capital or installation expense in the subscriber's home since the system would be implemented with hardware already there: the addressable converter for program reception and the telephone for order entry.

THE MILWAUKEE TRIAL

In an attempt to determine the value and operational characteristics of a national system, AT&T, Viacom, and Showtime/The Movie Channel, have entered into an agreement to do a small scale trial of such a system. In the trial, Showtime will provide the pay-per-view product via its Viewer's Choice service, Viacom will furnish the trial cable system, and AT&T will assemble a small scale, localized version of a national ordering system. In the trial, CableData has agreed to provide the processing of the ANI, the interface with the billing system, and the activation of the addressable system.

Trial Location

The trial will take place at Viacom Cablevision Of Milwaukee, a 36,000 subscriber Viacom system serving fourteen suburban communities in the Milwaukee area. The system has 108 channels of which over 60 are currently activated. Every subscriber has an addressable converter and will have access to the pay-per-view service in the trial. The system uses Zenith Z-TAC one-way addressable equipment.

This site was chosen for a number of reasons including: the demographics of its subscribers are typical of cable subscribers nationwide, every basic subscriber has an addressable converter, the system is of manageable size, it is served by CableData's billing system, every local telephone company central office will be capable of transferring ANI by the time of the trial, and AT&T will have the necessary network features installed in its Waukeesha, Wisconsin No. 4 ESS toll switching office, which serves the Milwaukee area.

Trial Objectives

The objectives of the trial are to gather information on the value and performance of this type of fully automated, potentially nationwide, ordering/billing system in a live pay-per-view environment and to identify issues associated with its use. There are five categories of information desired:

Consumer Reactions. This includes finding out how consumers like ordering pay-per-view movies and events using the system, whether they can use it effectively, the type and quantity of errors they make, the type and quantity of customer service problems that result, and whether changes in the system are required to ameliorate the effects of these errors.

Marketing Issues. These include determining the type of consumer education required, if any, a quantification of the frequency of use, and an evaluation of the marketing value of the system.

Technical Problems. These include identification and solution of any unexpected interface problems and the quantification of error rates, speed, time delays, and other measures of overall performance of the entire system and its components under conditions of real consumer usage.

Operations Problems. These include problems that may occur in operating the ordering system from both a cable company, service sponsor, billing vendor and AT&T perspective.

Billing Issues. One of the important objectives of the trial is to identify problems and issues associated with the automated interface to the billing system and, more generally, with the process of billing and collection for pay-per-view movies and events.

Trial Schedule

The trial is scheduled to commence in June, 1986 and to terminate in March, 1987, nine months later. Since the trial is primarily a marketing trial, it must run long enough for consumers to learn to use it and become comfortable with it — hence nine months. The start date was determined by technical hardware and software availability within the AT&T network.

Trial Architecture

The trial architecture is shown in Figure 1. The Viewer's Choice pay-per-view programming feed originates at the Showtime satellite uplink facility in Hauppauge, Long Island, and is beamed to the trial site via Transponder T5 on Satcom 3R. Customer's telephone orders will be handled within the AT&T public switched network using a modified version of 800 Service. The calling telephone numbers will be passed to Viacom's CableData Tandem computer system in Cleveland which will perform a number of validity checks, identify the callers that ordered, and transmit the appropriate data back to the addressable system controller in Milwaukee to enable descrambling in the customers' addressable converters.

Trial Order Entry

A description of the order entry process for the trial is as follows:

1. Each pay-per-view channel available will have a toll-free 800 area code telephone number associated with it. Current plans envision two such channels with the two numbers: 1-800-VIEWER1 and 1-800-VIEWER2. To order a pay-per-view movie or event, the cable subscriber simply dials the ordering telephone number for that channel. The caller may utilize a telephone with either Touchtone or dial-pulse signaling. However, the consumer must dial from his or her own home or from a telephone known to the local cable company.

2. The call is routed, as are all 800 calls, by the local telephone company to AT&T's network. AT&T obtains the caller's telephone number automatically by Automatic Number Identification from the local telephone company's central office under the terms of equal access.

3. The call is routed to AT&T's Cleveland switching office where, by an arrangement of trunks within the switching equipment, it terminates at an existing AT&T mass announcement facility. Here, answer supervision is returned, and a "thank you" announcement is given to the caller acknowledging that the order has been placed. When the caller hears the announcement, he or she either hangs up or the announcement facility disconnects the call when the announcement is completed.

4. AT&T passes the calling and called number (indicating the channel which carries the movie or event that the customer wants) to the CableData computer in Cleveland over a dedicated private data line in a standard data protocol.

5. The CableData computer, a Tandem Non-Stop system, contains an on-line database of the cable company's subscribers' telephone numbers. The processor performs a number of validity checks or "edits" including:

- That the customer's telephone number exists in the database;
- That the customer's home is equipped with addressable outlets capable of handling pay-per-view;
- That the customer's account is active;
- That the customer is not in collections;
- Whether ordering the event will not put the customer beyond their credit limit;
- Which outlet in the home to authorize.

Those orders not qualifying for pay-per-view service will be noted automatically by CableData's DDP software. A phone call to that customer, informing them that their order cannot be accepted, can be placed either automatically by DDP software through the Tandem computer and Programmable Auto Dialer (PAD), or manually by customer service representatives using a report generated by DDP. The cable company may choose to pursue these as future customers, candidates for addressable converter installation, or to motivate payment of an overdue bill.

7. The Tandem processor in Cleveland then passes the consumer's identity to the addressable system controller in Milwaukee through an automated interface via a network of private data lines. At or before the start of the program, descrambling is activated in the subscriber's addressable converter.

8. Counts of the number of orders for each program will be available to the pay-per-view program distributor and other authorized recipients within minutes of their being placed.

9. The charges for the pay-per-view program will appear on the cable subscriber's monthly cable bill prepared and rendered by CableData.

Trial Capacity

The capacity of the trial system has been designed to be able to handle any impulse load that can reasonably be expected. Since the system is composed of a sequence of processing steps, the ultimate capacity will be determined by the capacity of the slowest component. An analysis of the capacity of each step is as follows:

AT&T Public Switched Network Capacity. The AT&T network will be configured to handle up to several hundred calls per minute in the trial depending on the call holding time. This is determined by the trunking arrangement in the Cleveland switching office. The local telephone company central offices, the AT&T switching offices involved in the calls, and the mass announcement system have far greater capacity and so are not expected to be a limitation. Since the calls themselves have no egress from the AT&T network, no 800 service lines to the sponsor's premises, which have traditionally been the bottleneck in telephone-based systems, will be required.

CableData Capacity. CableData's DDP information and billing system, using a Tandem Non-Stop computer, will provide rapid processing of: 1) all calls received from AT&T, and 2) commands sent to the addressable controller authorizing those converters qualifying for the pay-per-view service ordered. This is accomplished by prioritizing both the verification edits and box authorization commands occurring between memory and disk, maximizing the hardware capabilities of the Tandem through use of CableData's DDP software. The exact capacity of this configuration will be determined by benchmark tests prior to the trial. However, it is expected to be more than sufficient to process the anticipated traffic.

Addressable System Capacity. The current Zenith system installed in Milwaukee uses a Zenith-provided Intel addressing processor whose capacity is 1200 to 1800 calls per hour. This is expected to be the limiting system factor. Viacom is considering replacing this processor with an HP1000 minicomputer whose capacity will far exceed that of the Intel processor.

The system is designed to be graceful under overload, should it occur. If calls arrive at such a high rate that the trunks in the Cleveland switching office are overloaded, callers will hear a standard reorder tone ("fast busy"). The other system components are all designed to buffer information that cannot be immediately processed so that, under overload conditions, orders are simply delayed, not lost.

CONCLUSIONS

The nationwide service concept described above is in the study stage and has not been committed for nationwide deployment. But, if the trial results are positive and it is determined that a service offering of this type would be useful and valuable, then it is likely that a nationwide service would be offered.

If it were to be deployed, the AT&T portion would be available under tariff or other appropriate regulatory structure to anyone. It is likely that it would be purchased by national pay-per-view distributors such as Viewer's Choice who would offer the service to its own affiliates. Likewise, CableData, as a supplier to the cable industry, expects to make any software or hardware developed as a result of the trial available to all of its customers.

The pay-per-view transaction system described in this paper has the potential to satisfy the most important requirements of ordering and billing:

- Nationwide Scope;
- Very High Capacity;
- Ease And Simplicity To Ensure Customer Acceptance;
- Low Up-Front Costs;
- Full Automation Including Billing;
- Turnkey Installation And Operation.

The partners in the trial, AT&T, Showtime, and Viacom, together with CableData believe that they have an important concept for the fundamental health and growth of the pay-per-view industry.

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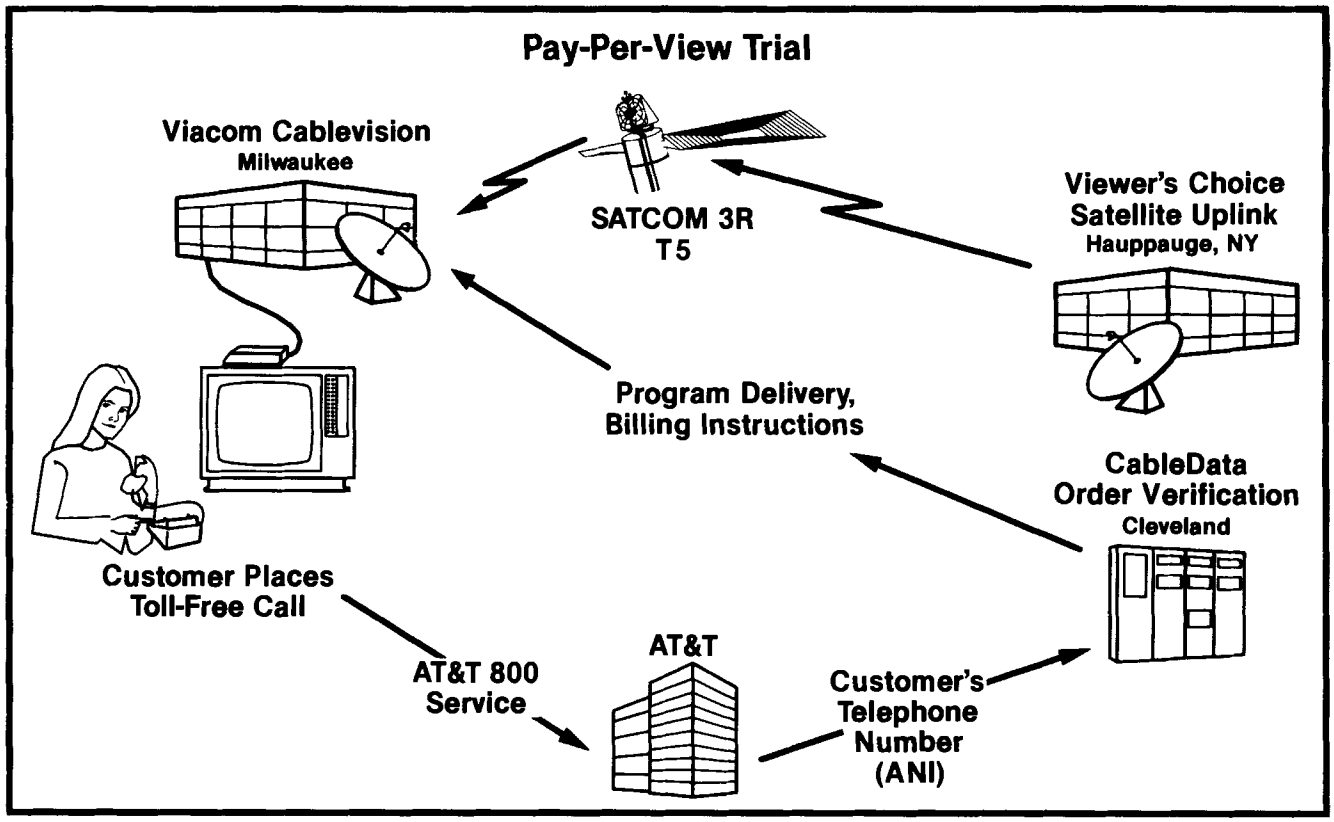

Figure 1 — Trial Architecture