JERROLD DATACHANNEL - THE OPTIMAL INFORMATION DELIVERY TECHNOLOGY FOR CABLE

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The purpose of this paper is to provide a marketer's perspective on our PlayCable product line in the context of new information services delivery over cable systems.

Normally, a marketer's job is to research the marketplace and then predict future customer needs based on current trends. The problem with the new information services revolution is that that just doesn't work that way. The information revolution that's now taking place, both within cable and without, is certainly fueled partly by a pent-up demand on the part of consumers for more information.

However, that in itself is not nearly enough to explain the phenomenon. Equally important is the rapid change in technology which enables information services to be available at much lower costs than previously. As a result, products and services which have been uneconomical in the past, suddenly become economical, but you sure can't tell that by asking the customers what they want.

Obviously, this information revolution is a marketer's nightmare from the standpoint of forecasting exactly which products consumers will buy at a given point in time. Said another way, it's easy to create new information hardware with exciting new features. It's very hard to build a product which is really a good investment for cable operators in terms of predictable revenue and pay back.

A second important difficulty in discussing information services products for the cable industry is that all of us are treading in new territory to some extent; territory which can also be occupied by the telephone companies. Constraints which have previously been imposed by regulation, either have been relaxed recently or may well be relaxed in the future, with the result that the competitive framework in which we all live is changing dramatically. Therefore, we've got to consider the impact of switched network technology as well as cable network technology as we develop products for our industry. We have to be realistic about what we can deliver with a competitive advantage over the telephone system. Most of us haven't spent enough time thinking about telephone technology and products to have a comfortable feel for the upcoming competitive battle for the consumer's dollar.

With these uncertainties as a backdrop, we at Jerrold have been working for some time to develop a comprehensive plan for an information services product line dedicated to the cable industry. Here are some of our basic considerations:

First, consider the whole universe of information services. Figure 1 plots

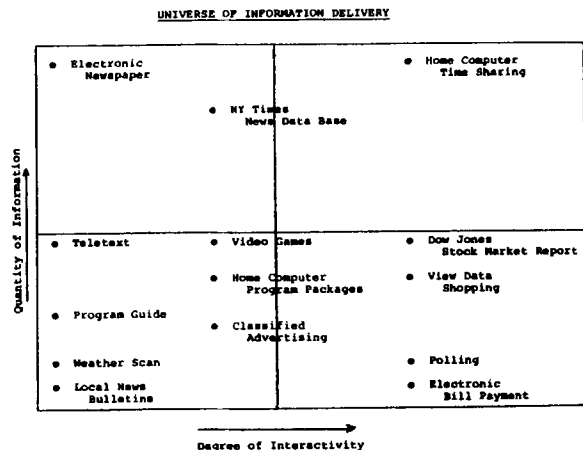UNIVERSE OF INFORMATION DELIVERY

Figure 1

various information services (which have been identified and discussed here at this convention) in terms of the quantity of information they contain and the degree of interactivity. For example, you can see that the cable system program guide contains only a very moderate amount of information and requires very little interactivity and so is located in the lower left quadrant of this chart, whereas, electronic bill-paying or polling requires a relatively small amount of information, but a high degree of interactivity, and therefore is located in the lower right.

Home computer time-sharing requires both a large amount of information in order to operate in real time and a high degree of interactivity with remote software and so it's in the upper right quadrant. And then there are products like packaged programs or video games which can be downloaded completely into home computers' local memory for local interactivity only. These fall somewhere in the middle.

What we've been attempting to do is segment all the possible information services in a way which is useful for defining a product line. Now let's look at Fact Number 2.

As you can see from Figure 2, today the cable industry is primarily one-way. Any
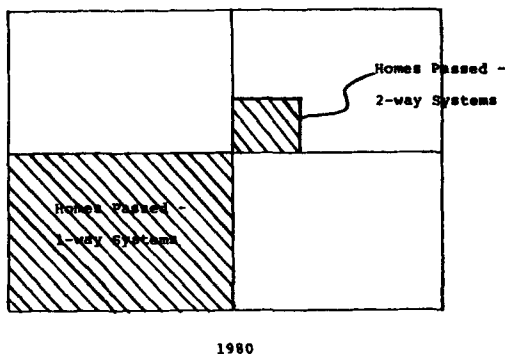
CURRENT CABLE SYSTEMS

1980

Figure 2

product developed for the cable industry must be developed with this in mind, if it's to be useful to a large segment of the industry today.

You might say, "Well, yes, that's now, but many of the major new systems being built are two-way. Won't most cable systems be two-way very soon?" Obviously, this picture is changing, especially in the new urban franchises where expanded channel capacity is the rule, two-way cable systems are commonly proposed, and all the most recent bids have contained proposals for interesting new interactive systems for security or other data services. As Figure 3 shows, we predict that by 1985 with the explosive new build rate of today continuing, approximately half of the country's cable systems could be two-way.
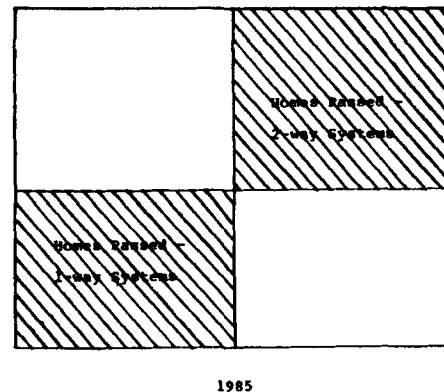
CABLE SYSTEM IN 5 YEARS

1985

Figure 3

From all this, we conclude that we must consider the one-way market, and it would be desirable that our new product be useful both in today's existing one-way cable systems, and tomorrow's two-way market as well.

If you refer back to Figure 1, we can see how these considerations come together. By segmenting all of the possible information services in terms of quantity and interactivity, we have identified a large number of potential services in the lower left quadrant which corresponds to services which can be delivered effectively over one-way systems. We have combined these considerations in the conclusion that our first product should be operable on a one-way system in order that the industry have the widest possible opportunity to implement it now and to experiment with customer demand for new information service offerings. That is our first criterion, as shown in Figure 4.

CRITERIA FOR INITIAL PRODUCT

INFORMATION SERVICES

● One-way

● Profitable for cable operator

● Consumer interest and value

● Use cable bandwidth effectively

Figure 4

Any investment in information services hardware by cable operators is a risk - because consumer demand hasn't been tested yet. So we've decided our second criterion should be one which minimizes the risk for our customers. We don't want

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our product to sell chiefly because it is useful in franchise applications. The payoff from that is too indirect. Instead, it must generate a clearly identifiable incremental revenue stream from subscribers – from the beginning.

The plain fact is that consumers don't have very much experience at all with electronic information services, so they don't know how to place a value on them. They may become very enthusiastic about their newness, or they may take a long time to sign up. We just don't know. And that translates into a larger than normal investment risk for cable operators. So our third criterion is that the new product must create consumer interest. They must perceive a value more than they are required to pay. A technically interesting concept – no matter how advanced – is not enough.

One final criterion: In the past two years we've analyzed the existing cable data delivery systems in an attempt to define the best approach in the long run for cable. Of course there is the existing news wire reception/modulation approach using full video channels. We have looked at Teletext, using the vertical blanking interval. We've looked at the variety of new two-way data service systems, some of which are exhibited here at the convention. And of course, we've looked at telephone as a natural competitor to interactive types of services. In doing so, we developed yet another criterion which I'm sure you'll agree is important. The cable industry has one obvious advantage over other forms of electronic media delivery, broadcast and telephone, and that's our bandwidth. Therefore, we established as one of our criteria that we should utilize cable's bandwidth if it would allow us to develop more economical information delivery systems.

Since the Teletext system uses no apparent bandwidth in the cable sense, and since our initial product was required to work over one-way cable, we specifically used Teletext as a reference point for our new technology.

Let's look at our future product, let's name it DataChannel for now, and see how it compares with Teletext.

As you can see from Figure 5, both operate on one-way systems, satisfying one important criterion. DataChannel certainly uses more of the available bandwidth than Teletext, but it has some important advantages which are inherent in utilizing that bandwidth. As you can see from the chart, Teletext, using the

	Teletext	DataChannel
One-way	Yes	Yes
Use Cable bandwidth effectively	VBI 5.7 MHz data rate 3840 characters per second per channel 52 channels max. • High-speed data acquisition circuitry • Bi-polar technology • $125 terminal	200 MHz data channels 13.983 KHz data rate 1271 characters per second 160 channels available outside video channels 1750 channels max. • Low-speed data acquisition circuitry • MOS technology • $100 terminal
Consumer interest and value	?	• Sound ?
New profits for cable operator	?	?

Figure 5

vertical blanking interval delivers 3840 characters per second per channel and has 52 available channels using the latest cable technology (Jerrold's, I might add!) Using the DataChannel approach, of 200 KHz channels, there are 160 channels available outside of the video channels, but within the cable spectrum. I suppose, theoretically, there are 1750 channels maximum, if you use the full 400 MHz bandwidth, but restricing ourselves to the non-video portions of the spectrum, you see that there's much more flexibility in utilizing the DataChannel approach compared to the vertical blanking approach.

In terms of information delivery rate, a single vertical interval DataChannel can deliver roughly 3 times the information per second as DataChannel, however, as I pointed out, there are 3 times as many channels available outside of the video spectrum and so that from the standpoint of capacity, it's more or less a wash. The important comparison is the data rate. Teletext uses what we call a high speed data acquisition circuitry approach using bi-polar technology, while the data channel approach with a much lower data rate, 13.983 KHz, operates with low speed data acquisition circuitry, using MOS technology. Therefore, the really important differences are not only the flexibility of location of channels and the number of them, but in fact, the terminal cost. Using comparable cost structures and margins, we computed that we could deliver a Teletext Decoder Terminal for $125.00 based on today's state-of-the-art electronics, but by comparison, deliver a DataChannel Terminal for $100.00. In other words, the Teletext technology is 25% more expensive. Regardless of what the absolute numbers are, as electronics costs follow the normal curve over time, inherent in the technology of DataChannel is this competitive cost advantage.

So this is the building block, this basic DataChannel technology which we believe utilizes cable's bandwidth more efficiently than the Teletext approach and therefore is more appropriate for our industry. From the cable system

operator's standpoint, especially in medium to large systems, these inherent differences could become very significant in terms of total investment.

However, focusing on our remaining two criteria, we feel that neither Teletext nor DataChannel are particularly strong in these categories. DataChannel does deliver sound, which is an interesting feature, but generally speaking, we don't know whether the basic services that can be delivered over these systems will capture consumer interest and therefore whether the cable operators will be able to profit from their investment in the equipment. Overall, I'd say Teletext is a fair product and DataChannel is a little better, but in the context of our present market we need to go further.

DataChannel might actually be the best basic data service for the future, after consumers have more experience with information delivery services and there is a segment of the market which is willing to spend money for that service alone. But for now, a different kind of service is needed, one that gets the consumer involved with electronic data in his home and starts him on the learning curve.

It occurred to us, that consumers have limited experience with one kind of information delivery service - video games. Given that such products are selling, consumers obviously perceive value in this kind of entertainment. Equally important, these games can simulate two-way interaction over a one-way cable system.

Jerrold in partnership with Mattel developed PlayCable. We believe it's an information delivery service that not only meets all of our criteria for the immediate market, but also allows us to test market an initial product which can establish the basic DataChannel technology in the cable marketplace so that a more complete product line can be made available in the future after consumers are comfortable with electronic information services.

Once again using Teletext as a reference, let's take another look at the third and fourth criteria, this time comparing Teletext to PlayCable (See Figure 6). The

differences are in revenue and cost. First of all, PlayCable requires only a $50.00 per subscriber investment in the terminal on the part of the system operator. Relative to our DataChannel future product, the PlayCable adaptor is lower in cost because it contains a lot less memory circuitry than is required in a free-standing DataChannel unit. This is because many of the functions are taken over by the Mattel Intellivision set, with which it is a companion. Importantly, this initial investment may be offset by approximately a $100.00 gross profit from the sale of the Mattel Intellivision module to the household. Although most cable operators are not currently selling hardware to their customers, this additional dimension of the PlayCable project means that before a household even receives the service, the cable system operator could be in the black or at least break even, considering his installation cost. PlayCable therefore can be inherently less investment than Teletext for the cable operator.

This still leaves out one, and perhaps the most important part of the equation, however, the consumer. So let's take a look at our last criterion (Figure 7).

CONSUMER INTEREST

	Teletext	PlayCable™
Interest and value to Consumer	• Text and data	• Text and data
		• Video games
		• Educational programs
		• Simulated 2-way interaction
		• Sound
		• $300 Intellivision
		• Games worth $450 for $120/yr.

Figure 7

The consumer spends $300.00 for the Intellivision Master Component in order to have all these video games and services, and clearly he get's a lot, as you can see from this chart. But is it worth it? Quite honestly, it's too early to tell, but we have every reason to believe that we will be successful. We are already proceeding with our market tests in four cities and we've endeavored to make sure these tests give us valid information from which to project the total cable marketplace. I believe PlayCable will do well because it offers a cost savings to the consumer, compared to purchasing the same products in a free-standing mode. Instead of buying the game cartridges for $20.00 to $30.00, depending on the cartridge, PlayCable subscribers can receive unlimited service for a fixed monthly charge, later on they will automatically have new

CABLE OPERATOR PROFIT

	Teletext	PlayCable™
Profit to Cable Operator	• $125 terminal cost	• $50 adaptor cost
	?	• $100 profit on sale of Intellivision
	?	• $120/yr. revenue

Figure 6

programs as they are developed. In comparison to the service offering of PlayCable, the customer would have to pay over $450.00 to buy separate cartridges. Therefore, we are confident that as Mattel completes their first year of marketing the Intellivision through retail channels, PlayCable will look like a pretty attractive cost saving alternative from the standpoint of the consumer.

To sum up, the PlayCable technology is inherently less expensive than competing cable delivery technology. It offers cable system operators a direct path to new revenues, and it offers the consumers a product that at least some of them want, at a cost advantage.

I don't doubt that the next few years will see quite a few two-way cable systems built and many different packages of data delivery technology and services. We intend to compete in that area, but that's not the place for most of the industry to start. At Jerrold we recognize this fact, and we've directed our initial efforts to delivering information over today's cable system to today's consumer.