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Virtual Parent Teacher Conferences
New Voice Messaging Connects Parents with Schools Round the Clock

Phoenix, Arizona - Pen in hand, second grade teacher Connie Bellmore of Madison Simis School is writing a script at her school desk. Her students have left for home, and, soon, so does she. In the comfort of her own home, the classroom veteran finishes writing. She then picks up her phone, dials a seven-digit number, inputs her access code and, reading from the script, says, "Hello. This is what's going on in Mrs. Bellmore's class during the week of November 14-18..."

In 67 seconds, Bellmore thanks parents who attended last week's parent conferences and says she looks forward to meeting more parents this week. She explains the week's lesson plans, reminds parents of early class dismissal Wednesday, and discusses the theme of a story her class will read. "T-shirt orders are due this week, " she adds in closing. "They make a great holiday gift...Bye, now."

When she hangs up, her message is automatically sent, via U S WEST Voice Messaging, to all her students' parents who have voice mail. Parents not on the system can access the message by calling the school's voice messaging system and dialing Bellmore's seven-digit code.

Bellmore can use the voice messaging system from any phone. And she is not the only teacher using it.

All teachers and administrators at Madison Simis, Copper Canyon, and St. Thomas the Apostle Catholic elementary schools use the system, dubbed "The Parent /Teacher Exchange."

The Phoenix schools are the first in U S WEST territory to try the new product, which, unlike "Homework Hotline" systems, allows two-way communication between parents and teachers.

- more -

2-2-2 U S WEST Teacher Voice Mail

"I love it," Bellmore later said of the Parent /Teacher Exchange. Parents, she said, "like it because it's more personal than a piece of paper. It adjusts to their schedule. Parents can call at 10 p.m. if they want. They say they're comfortable talking on the system. It's more personal. Eventually, I hope to get away from all the paper communications we use."

After hearing the teacher's message, listeners can push "1" to replay the message, push "2" to leave a message, or they can push "3" to access the main menu of nine options, including enrollment information, calendar of events, cafeteria menus, and reporting absences to school.

"I'd been trying to get on a system like this before I came to this school, " said Rick Stephen, principal of St. Thomas.

"It helps us communicate better with parents, " he explained. "One thing you often hear parents say is 'You're not informing me.' Some of our teachers deal with up to 180 students a day. With that many students it's an overwhelming task to try to keep up with each parent. Voice Messaging allows teachers to put the information on the phone. Parents can just pick up the phone now to find out what's happening."

He's not just referring to class events, he said, but extracurricular activities, too. Stephen told of a recent carnival at St. Thomas School. The weather experts predicted rain on the day of the events.

"We got on the phone and said we're still having the carnival," he recalled. "The rain stopped just before the carnival began. While I was there, parents came up and said, 'Hey, I got your message.'"

The schools began using the Parent Teacher Exchange at the start of the 1994 fall semester. What's the cost of such a system? U S WEST has not yet determined a price to charge schools using parent-teacher voice messaging. It's in the testing and marketing phase until the end of the school year.

"We're trying to gauge usage, then we'll cost it out based on that information," said John Peketz, U S WEST product manager. "We're going to try to keep the cost as low as possible."

U S WEST Voice Messaging for parents is priced at $6.95 per month. Parents who try the product get their first month's use free. U S WEST also waives the installation charge.

Voice messaging rings bell for schools

By PETER LOGE
The Business Journal

US West Communications may have found a new way to sell its voice messaging service and at the same time help parents and teachers stay in touch.

A service being tested by US West at Madison Simis, Copper Canyon and St. Thomas the Apostle elementary schools provides a voice messaging system for the schools and the teachers, and can broadcast messages to parents who also have voice mail.

US West officials hope that parents who have children at schools with the voice mail system will subscribe to the service themselves, says Tony Seese-Biede, a spokesman for US West.

So far the test is going very well, says John Peketz, product manager for voice messaging. "We've had an incredible response from parents."

The service works like this: Teachers and administrators at the school get a voice mailbox; those who want to use the service leave classroom announcements, cafeteria menus, athletic schedules and so forth on the system. The system then automatically calls the voice mail boxes of parents with US West voice messaging who have subscribed to the service.

The teacher's message is left in those parents mailboxes, without the phone ever ringing. Parents without voice mail can call into the school's system and hear the same announcements. After hearing the announcements, parents can then leave messages for their children's teacher.

"I love it," says Mitzi Tadin, a parent at St. Thomas the Apostle. Tadin, who says she got voice messaging because of the new service, says she uses it to leave messages for fellow Brownie troop parents. "It's tough to count on first graders to take a note to parents; this makes it possible to, in one step, leave a message for all the Brownie parents," she says.

Seese-Biede, who has a son at Copper Canyon Elementary School, says he is a frequent user of the service. He says that two or three times a week, the principal at Copper Canyon will leave a message on parents' voice mail about upcoming school events. This cuts down on the amount of paper that his son is asked to bring home, and makes it easier for Seese-Biede to keep track of school activities.

Seese-Biede says he hopes to be able to use a similar service for Little League.

Peketz says that such applications are on the horizon. "We are trying to use the school systems to show the power of this and and provide a needed service to the schools," Peketz says.

US West has plans to offer the capability to anyone who is interested — from block watches to Boy Scouts — by the end of this year, says Peketz.

US West has not determined the cost of the system and is providing it free to the test schools. Parents who sign up for the service get the first month free, and participating schools with at least 50 percent of student homes registering receive gifts of between $2,000 and $3,000 from US West, says Seese-Biede. All of the participating schools have met that goal.

The company expects to start charging for the service within the year and expects it to be a revenue generator, says Seese-Biede. The company still is doing cost studies and will not fix rates until the studies are complete, he says. US West may charge schools a small fee for the service to supplement what US West charges parents, he says.

This spring, US West is expanding its test to a second school in the Madison district, says Peketz. If the test is successful in the Phoenix market, US West will make it available in to any school district that shows interest, says Seese-Biede.

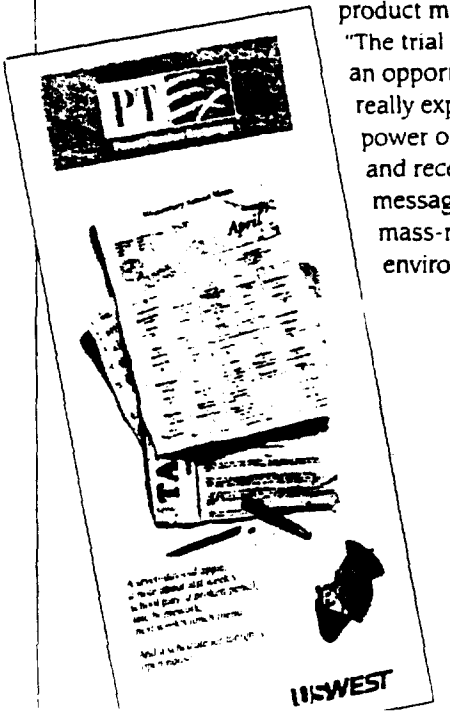
Phoenix schools use Voice Messaging to get the word out

U S WEST is teaming up with three Phoenix schools this fall to test a new concept in school/home communications.

Parent Teacher Exchange, or PTX, will allow teachers and administrators to distribute information such as school activities, lunch menus, homework assignments and study topics directly to parents using U S WEST Voice Messaging™.

Parents who have U S WEST Voice Messaging will be put on distribution lists so that all school information will be delivered automatically to their voice mailbox. They also can receive and reply to messages regarding homework assignments and specific information on their children's accomplishments and performance.

The PTX trial is a real-world application that will provide data on new ways to use Voice Messaging. It's a natural, since schools need to communicate a high volume of information and parent involvement in education is so important to so many of our customers, says John Peketz, Voice Messaging product manager. "The trial gives us an opportunity to really explore the power of sending and receiving messages in a mass-market environment."



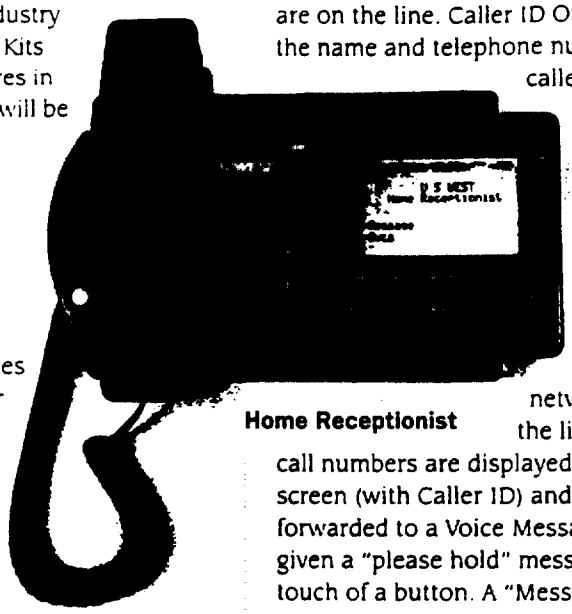
Services hit home

U S WEST's residential customers can choose from several new products and services this year that range from Voice Messaging Start-Up Kits to a "personal receptionist."

In a telecommunications industry first, Voice Messaging Start-Up Kits can be purchased in Target stores in Phoenix and Omaha and soon will be available at a major retailer in Denver. The kits offer network message service in a box as an alternative to answering machines.

A new spin on the old note pinned to the collar, Parent/Teacher Exchange creates a two-way message system for educators and parents using Voice Messaging. Automated distribution lists allow teachers to send "notes" home in a timely, non-intrusive and private way. Parents also can call into "listen only" boxes, or leave private messages for teachers. A trial in Phoenix indicates the service is a huge hit.

Now telephone users don't have to debate whether to answer any incoming calls when they are on the line. Caller ID On Call Waiting displays the name and telephone number of the incoming caller on a special Caller ID unit.



Home Receptionist

Busy households and home office users will appreciate the Home Receptionist™. Customers can manage calls and take advantage of several U S WEST network services: When the line is in use, incoming call numbers are displayed on the text display screen (with Caller ID) and can be answered, forwarded to a Voice Messaging mailbox or be given a "please hold" message — all with the touch of a button. A "Message Waiting" light provides a visual cue to check for messages.

November 3, 1994 - The Catholic Sun

New system links parents with schools

By Joy E. Triche
Catholic Sun Staff

New technology offered by the phone company could end the days of parents digging through backpacks for important notes from teachers and principals.

St. Thomas the Apostle school is one of three schools in the valley testing the "parent-teacher exchange program," a new school phone system from US West Communications.

When parents or students want general school information or information left by a specific teacher, they can call 808-8655, a new phone line. Likewise, if families need to leave a message for the school office, a teacher or a member of the staff they can do so with this new program.

ALSO, families who have US West voice messaging, can receive messages from teachers. Teachers can record a message anytime and send it to the home phones of all of the students in their class by dialing one set of numbers.

Frederic Stephen, principal at St. Thomas the Apostle said, "When you call into this designated line you get a menu that says 'dial one for calendar and announcements; dial two for cafeteria menu; dial three for athletic schedules; four for special activities.'

"They dial nine to report student absences, or what the caller can do is dial into any of the teachers' or staff members' mail boxes. You can either call in and see what message the teacher has left or leave a message for the teacher."

US WEST chose three schools locally to act as guinea pigs for the "parent-teacher exchange." St. Thomas was the only private school chosen.

Stephen said the program provides an opportunity to enhance communication between teachers and parents.

"WHAT WE hear most often is that parents did not know about assignments, and the student does not get the assignment done, and then there is a problem. This helps with some of that communication, and it helps to make teachers more accessible," Stephen said.

Some teachers agreed that the new system provides more opportunities to communicate with parents.

"I HAVE MY assignments on the message for the week," said Cissy Frakes, junior high teacher at St. Thomas. "It is keeping me very organized, and the students and the parents have the information available."

During the day she said she often gets too busy with students to return parents' calls, but the new system helps.

US West will continue to help St. Thomas, if the school can get families to support the program.

Stephen said if 50 percent of families decide to try voice messaging, US West will donate $1,800 to purchase fitness equipment for students.

"If parents get voice mail it will make it even easier to send everybody important information and reminders," said Susan Todd, a fifth-grade teacher. "It will cut down on a lot of the papers and flyers sent home and digging papers out of backpacks."

THE VOICE message service is $6.95 a month.

John Peketz, product manager of Voice Messenging Service at US West said in testing the product US West wanted to look at private schools as well as public school and a variety of economic and demographic factors.

ALTHOUGH he said it is too early to gauge how successful the program is, Peketz said he expects it to be a "win-win situation."

He said his company is currently working to bring the cost of the program down.

"We are trying to find out how inexpensively we can put this in schools, knowing most school budgets are tight."

ATTACHMENT B

THE ECONOMICS OF STRUCTURAL SEPARATION FROM THE PERSPECTIVE OF ECONOMIC EFFICIENCY

FINAL REPORT

Agreement No. 9500046315

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April 4, 1995

THE ECONOMICS OF STRUCTURAL SEPARATION FROM THE PERSPECTIVE OF ECONOMIC EFFICIENCY:

ABSTRACT PREPARED BY RRC, INC.

This report addresses the key issues in the debate about whether to adopt regulations that require BOCs to offer enhanced services only through separate subsidiaries. Our analysis evaluates these issues using the criteria of consumer welfare and efficiency in production, innovation, and marketing. Economic analysis indicates the BOCs should be allowed to provide enhanced services through an integrated structure. Replacing a market determined structure with a structure prescribed by regulatory fiat will result in significant welfare losses.

A forced subsidiary structure imposes significant costs that will ultimately be borne by consumers of LEC basic services and enhanced services. The imposed costs include one-time separation costs, higher costs of basic and enhanced services due to loss of joint production complementarities, and higher costs of innovation and a slowing of innovation due to loss of technological synergies arising only from an integrated structure.

The benefits claimed by the proponents of structural separation are either overstated or nonexistent. Some benefits are provided by regulations other than structural separation, such as ONA. Proponents claim that structural separation would provide necessary safeguards against access discrimination. However, the necessary conditions for profitable access discrimination are not met. Even if access discrimination was profitable, structural separation would have no effect on the result. In contrast with what is assumed by proponents of structural separation, the BOCs could not engage in access discrimination without being detected. There are sufficient safeguards against access discrimination in existing penalties, ONA provisions, anti trust laws, and the threat of regulatory change.

Proponents claim that in an integrated structure, BOCs will be able to shift costs from enhanced services into the rate base for basic services, resulting in higher prices to basic service rate payers and prices below cost for enhanced services provided by BOCs. The premise is that BOCs will use their monopoly in local services to try to monopolize the enhanced services market. This strategy is not founded in economic analysis, which indicates the BOCs are more likely to benefit from selling access to a competitive market. The economic incentives are for the BOCs to price enhanced services to maximize profits.

Any of the benefits sought by the proponents of structural separation are available with market driven unbundling and the pricing of the unbundling at cost. These non-structural remedies are available with ONA. Most importantly, the coming competition in LEC basic services will require the BOCs to aggressively market their LEC basic services if they are to maintain their market position.

The lessons from other industries underscore the benefits of market determined firm organization. In the banking industry, the natural gas pipeline industry, and the airline industry, regulators have attempted to level the playing field only to withhold welfare enhancing efficiencies from the market. Structural separation in the production of enhanced services would be a replication of these mistakes.

In summary, if structural separation is imposed, consumers of LEC basic services and enhanced services will pay higher prices and wait longer for products to be introduced, implying significant welfare costs.

The Economics of Structural Separation from the Perspective of Economic Efficiency

I. Introduction

Current controversy centers on whether the regional Bell Operating Companies (BOCs) should be allowed to continue providing enhanced telecommunications services through an integrated firm structure or whether enhanced services must be offered through separate subsidiaries with separately located facilities and separate management. Proponents of structural separation argue that only by separating the provision of basic local service from enhanced service can the public be protected from various abuses. Some consumer groups see separation as protecting basic service customers from being charged costs attributable to enhanced services under the existing integrated firm structure. Some enhanced service providers (ESPs), such as MCI, see structural separation as a safeguard against potential monopolistic abuses from the BOCs attempting to leverage their monopoly power in basic services into the enhanced services markets. Still other providers of enhanced services feel that structural separation would eliminate an important BOC cost advantage, with the result being a "level playing field". In contrast, the BOCs argue that the separation of basic services from enhanced services would result in a higher cost, more inefficient form of organizational structure, with the result that both consumers of basic services and enhanced services will pay higher prices.

Interestingly, the claims of both sides may be true to varying degrees, leaving policy makers in a conundrum of choosing between conflicting policy goals. For example, how are policy makers to resolve the tradeoff between a "level, but high cost playing field" favoring independent enhanced service providers versus higher prices to consumers of basic and enhanced services? Fortunately, if policy makers are willing to adopt as their policy criterion the notion of economic efficiency, very clear policy directives emerge. This report views the structural separation issue as a problem for applied welfare analysis, requiring policy makers to make informed estimates about the costs and benefits of structural separation.

Section II identifies three distinct costs arising from structural separation. First, separation would result in significant "one-time separation costs" associated with physically disrupting ongoing integrated operations, changing physical locations, modifying software and hardware equipment, incurring search costs associated with new personnel, and disposing of excess capacity in the parent company. Second, structural separation would raise the day-to-day costs of providing basic and enhanced services because cost complementarities favor joint production. Third, structural separation would impose both higher research and development (R & D) costs and slower new product innovation, because technological synergies arising from joint R & D would be lost with separation.

Section III considers the alleged benefits arising from structural separation. Specifically, we address three benefits claimed by proponents of structural separation. First, structural separation is believed by some to provide stronger safeguards against access discrimination, thereby fostering competition in enhanced services markets. Second, separation is presumed to prevent accounting abuses from loading the costs of enhanced services into the basic service rate base since enhanced services would effectively reside in a separate subsidiary for accounting purposes. Third, separation would presumably eliminate the incentive to cross subsidize the price of enhanced services by using profits earned in the basic service market to underprice enhanced services, allowing BOCs to monopolize these markets as well.

Section IV recapitulates the findings of Section II and III and argues that structural separation will only result in substantial costs and minor benefits. Instead of structural separation, we emphasize the importance of two key non-structural remedies that will produce the benefits sought in Section III without resulting in the costs in Section II. Specifically, we emphasize the desirability of unbundling access services to ESPs and pricing these access services at cost. Unbundling, which does not depend on structural separation, prevents the BOCs from restricting entry into enhanced services and facilitates competition. Pricing access services at cost promotes long run efficiency. These non-structural remedies are key components of the existing policy of Open Network Architecture (ONA). Their continued vigorous enforcement is a proper policy action.

Section V looks at the issue of structural separation from the broader perspective of what determines efficient firm structure--the extent of vertical integration, joint production, and corporate governance. Examples from banking, pipelines, and airlines show that regulations have often

inhibited the evolution of efficient industry structure. These examples provide strong reasons why regulatory fiat should not replace that of the market in determining firm and industry structure

II. Costs of Structural Separation

A. One-Time Separation Costs

Structural separation, imposed after its relaxation in Computer III, would lead to substantial costs that would ultimately be borne by the consumer. U S WEST staff has determined that a return to the requirement of structural separation would cost between $58.7 million and $90.6 million.[1] This does not take into account perhaps even greater costs attributed to dislocation, structural duplication, and management inefficiencies. On the consumer side, the one-time separation actions could impose inconvenience and economic loss upon consumers as services are temporarily interrupted during the transfer.

1. Direct Expenses of Building and Equipment

The U S WEST study of separation costs include an estimated $11.979 million for equipment and software to support the anticipated 2,500 member subsidiary staff. Another $1.024 million must be spent on installation and $2.086 million on support personnel. The PBX, internal cabling, data and voice circuits, and uninterruptable power supply will cost another $3.165 million. Administrative support is expected to cost $1.049 million. Related taxes are estimated to be $.655 million. The total equipment, support personnel, software, and taxes, therefore total $20.961 million.

The study presents two alternatives to housing the subsidiary: an owned facility and a leased facility. The owned option would cost $69.600 million and the lease option would cost $37.717

[1]See "Structural Separation of Enhanced Service Offerings," US West Management Information Services, March 29, 1995.

million. The lease cost is an annual reoccurring expense. Overall, the estimated costs of separation is reported to be $90.561 million (owned facility) or $58.677 million (leased facility). At any reasonable discount rate, the owned facility option produces the least present value cost.

2. Disruption Costs

The process of transferring operations into a separate facility requires significant downtime for affected staff. Those being transferred into the new subsidiary must prepare their work-environment for the physical relocation. During the transport of the materials, staff cannot function effectively. Unpacking materials takes additional time. For a realistic estimate, one must expect that some materials will be mis-routed, requiring extra days to locate and transfer.

New hires require time to become as productive as those being replaced. Teams of personnel must be united and operating procedures defined. For the less skilled, this transition may require days. For skilled personnel, this transition may require months. During this time, productivity will suffer, resulting either in added costs or reduced levels of service to the customer base.

3. Excess Capacity Costs

With the transfer of personnel and equipment to the subsidiary, the existing offices of U S WEST would be underutilized. At least 45,000 square feet of office space would be vacated, and an extensive amount of computer equipment, telephone equipment, and cabling would remain in the vacated premises. If these facilities being vacated were leased, the option for renewal would be rejected, but the equipment would have to be stored or discarded. If the space were owned, U S WEST would presumably lease the space to outside firms, also necessitating the removal of equipment, furniture, etc. These costs have not been included in the estimates.

B. On-Going Cost Complementarities in Operations and Marketing

Cost complementarity is a simple but important concept. Strictly defined, a firm experiences cost complementarity when the production of one product leads to reduced costs of producing another product. A simple example of cost complementary can be borrowed from the agricultural sector. Apples and honey are jointly produced. The bees polinate the apple blossoms, increasing apple production. The nectar from the apple blossoms increases honey production. Therefore, it is not surprising that the two activities are performed jointly. The average cost of production is reduced if production is joint.

1. Cost Complementarities in Operations

Cost complementarity is a primary reason for integrated personnel, equipment, and facilities in the provision of enhanced services. This cost complementarity largely stems from the nature of the production processes for both basic services and enhanced services. Both are substantially computer dependent, and development and improvement of these services entail changes in and extensions of computer software. It is this production environment that partly establishes the interdependence of the two production processes.

As new software designs are considered in basic services, there are always multiple paths to the same destination. However, there is often one path that is particularly conducive to the unbundling of a basic service that is valuable in the provision of a marketable enhanced service. Consider a hypothetical example. New software techniques become available that will speed the reset of a dialtone when a customer wants to make a second call. Two methods are possible to incorporate the new software technique into existing systems. One replaces an existing module that "remembers" the customer's previous call numbers. The other method utilizes the existing module but inserts a "call" to a new subroutine, leaving the structure of the old module intact. An enhanced product could be developed wherein the customer, making a series of calls, can retrieve previous call numbers. The new service allows the customer to "scroll" through the previous numbers and re-enter any on the existing list.

Without the knowledge of the planned enhanced service, the programmer is just as likely to insert the new module as utilize the call to the subroutine. If the call to the subroutine is selected, the costs of extracting the previous customer-dialed numbers is relatively inexpensive. If the new module is inserted, the previous numbers are not retained and new software must be built to capture those numbers. Only with the joint realization of enhanced products possibilities and the routine upgrading of system software can the cost complementarities be captured. Structural separation eliminates this cost complementarity.

The industry has already experienced the effects that structural separation has on the provision of enhanced services. The earliest provision of Voice Messaging Services (VMS) by AT&T was cancelled due to the structural separation requirement.[2] Within U S West, numerous enhanced services to be deployed will be scrapped with structural separation because the ongoing costs of providing these services will increase signficantly.

A number of other examples of the loss of cost complementarities through structural separation is available from U S WEST and other BOCS. U S WEST's experience in the provision of ESI (an enhanced fax facility) is one example. U S WEST introduced ESI through its U S WEST subsidiary. The election to provide ESI through a subsidiary was not imposed by CI-II but was an internal decision based upon the need for additional space and the failure to realize full cost complementarities. The formal report from an interview with the head of ESI includes the following comments:[3]

> "Separation made this situation harder...
>
> Customer must separately buy 'call forward busy/no answer' (which is not ONA) and be billed separately for it, ...
>
> Also harmful in the channel: i.e., inability to use U S WEST channels, ...
>
> Under CI-II rules could/would have integrated marketing, ...
>
> Part 64 gave separate sub a bad deal on using parent resources, ...

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[2]See Hausman, Jerry A. and Timothy J. Tardiff, Costs and Benefits of Vertical Integration of Basic and Enhanced Telecommunications Services, March 29,1995.

[3]Interview with Jeri Korshak, former head of ESI.

Systems costs very high due to separate facilities, ...

Didn't realize potential of integrated messaging."

In the end, U S WEST pulled the product from the market, booking a $100 million operating loss (before taxes) over a three year period. The post-mortem evaluation illustrates the importance of integrated personnel and facilities.

Structural separation would eliminate the existence of cost complementarities in the provision of enhanced services. Substantial losses would be felt in at least two additional areas: marketing and R&D. The ensuing higher costs would result in either higher prices of those services that are brought to market or the exclusion of services whose expected returns fail to meet corporate standards. In either situation, consumer welfare would be reduced.

2. Cost Complementarities in Marketing

U S WEST currently utilizes marketing resources jointly employed in the sales of basic services and enhanced services. This reduces the need to duplicate marketing efforts and enables U S WEST to offer lower prices for both basic and enhanced services. Not only does joint marketing save resources in the production of these marketing services, customers value the convenience of being able to order a variety of services through a single source.[4] This is a complementarity that would be eliminated with required facility separation since the subsidiary offering enhanced services could not make use of marketing personnel involved in marketing of local exchange carrier (LEC) base services. The additional costs of separate marketing necessarily must be borne by the consumer.

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[4]Evidence from the market for long distance services suggests that competitors do not substantially suffer from joint marketing. Long distance competitors to the "default" long distance carrier achieved growing market shares. The inconvenience of placing a call to the competitor proved to be insignificant. Price was the determining factor in long distance markets, and price should be the determining factor in the provision of enhanced services.

C. R&D Cost Complementarities

1. Technical Aspects Creating Cost Complementarities

U S WEST utilizes innovation complementarities in the development of enhanced services. Technical personnel in basic services, when combined with new-product designers for enhanced services, form a research team that more efficiently travels from an idea to an innovation. This combination reduces R&D efforts and brings products to the market more quickly and less expensively. These innovation efficiencies are common when product innovation requires multiple sets of expertise. To maintain strict separation is to eliminate much of the engine of invention. NERA shows that structural limitations delayed the development of numerous enhanced services and computed the welfare losses totalling over $100 billion per year.[5] The simple point is that new products confer large benefits to consumers--far more than the prices they pay. When a product never reaches the market or is delayed, society is worse off.

Other evidence that an integrated system provides innovation advantages over an imposed subsidiary structure stems from the modern organization and conduct of research in areas outside telecommunications. This examination proves that there is a risk of loss of research efficiency in forcing a separation between the provision of basic and enhanced services among BOCs. Structural separation also reduces the overall level of research activity if complementarity exists. When operations are structurally separate, benefits of research in a single structure that spillover to the other structure are ignored in evaluating the profitability of the research. In effect, structural separation results in the introduction of externalities that yield an inefficient level of research activity. In a free market, when significant externalities exist, firm structure is altered to internalize the externalities. Forced structural separation entails a loss of efficiency by not allowing the internalization of research externalities.

Consider the treatment of joint research by legislatures. The antitrust laws of the United States are designed to prevent collusive activity among firms. Yet, the one area of cooperation among firms that is universally viewed as advantageous is joint research because such joint research

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[5]See Hausman and Tardiff (1995).

internalizes any spillover benefits. Many have advocated that antitrust policies should be changed to encourage joint research.[6] The advantages of research cooperation are viewed as potentially great, and the risk of collusive action for purposes of monopolization arising from this activity is viewed as small. This is an important consideration, as the opponents of the integrated approach claim risk of monopolization by BOCs as a reason for separating the people most knowledgeable about the basic service network from those concerned with enhanced services. What the proponents of separate subsidiaries are trying to accomplish is complete separation of the BOCs into separate companies along lines of the type service offered. This is a backwards move from the standpoint of innovation in the technology used to access the local service distribution system, long run competition, and consumer welfare.

Joint research has been encouraged through legislation, such as the 1984 National Cooperative Research Act, which encourages joint research by exempting the involved companies from punitive damages or the trebling of damages should they be convicted of violating antitrust laws. Such cooperation is not evidence of violation of antitrust laws, and 111 cooperative joint research endeavors were undertaken between January 1985 and June 1988.[7] Also, "major research consortia have been established in recent years in such diverse areas as glass bottles, computers and semiconductors, and boiler pumps for power plants. In December 1988 a Presidential commission urged the creation of several consortia comprised of industry, government, and university laboratories

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[6] See Ordover, Janusz A. and Robert D. Willig, " Antitrust For High-Technology Industries: Assessing Research Joint Ventures and Mergers", *Journal of Law and Economics*, 1985, 28: 311-33; Grossman, Gene and Carl Shapiro, " Research Joint Ventures: An Antitrust Analysis", *Journal of Law, Economics*, and Organization, 1986, 2:315-37; Brodley, Joseph F., "Antitrust Law and Innovation Cooperation", *Journal of Economic Perspectives*, 1990, 4:97-112; Jorde, Thomas M. and David J. Teece, "Innovation and Cooperation: Implications for Competition and Antitrust, *Journal of Economic Perspectives*, 1990, 4: 75-96; Shapiro, Carl and Robert D. Willig, "On The Antitrust Treatment of Production Joint Ventures", *Journal of Economic Perspectives*, 1990, 4: 113-30.

[7] Jorde, Thomas M., and David J. Teece, Innovation, Cooperation, and Antitrust, Berkeley, 1988.

for research in superconductivity..." [8] Even international joint ventures in research are becoming increasingly common. [9]

The concern of non-BOC ESPs is that the offering of LEC basic services and enhanced services within one firm will lead to anticompetitive behavior. The typical concern in other industries is that the joint research effort will also result in a collusive setting of the prices of the developed products. This concern is not transferable to telecommunications.

The need for coordinated development in LEC basic services and enhanced services is increasing with time. Technological changes occur very rapidly in the provision of LEC basis services, and most of these technological changes occur in the form of computer software changes. The industry has been on a continual move in the direction of computer-controlled switching from mechnical switching. Unlike mechanical switching devices of the 1980s, computer software opens vast expanses of possible paths to the same destination. Unless the path taken is the ideal path that interfaces best with the production of a particular enhanced service, there are inefficiences generated that were unintended but unavoidable without a close interrelationship between the two operations.

2. The CEI Plan Safeguard

The rate of flow of new products introduced in the market is restricted whenever the potential profitability of an innovation is reduced. One safeguard, CEI plans, has the potential of restricting this rate of flow. Current implementation of CEI plans as a safeguard appear to have had little impact upon innovation. Appendix A lists enhanced services which have moved through U S WEST's innovation pipeline. However, disclosures of new product plans before their release can destroy the critical time protection that innovators capture in pioneer products.

The time between the deployment of a new product and the replication of the product by competitors gives the pioneer firm time to capture profits that justify the investment in R&D. The importance of this protection has been recognized by legislatures who have enabled firms to use

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[8] Bolter, Walter G., McConnaughey, James W., and Fred J. Kelsey, Telecommunications Policy for the 1990s and Beyond, M.E.Sharpe,Inc., 1990, page 61.

[9] Carleton, Dennis W. and Jeffrey M. Perloff, Modern Industrial Organization, Harper Collins, 1994, page 685.

trademarks and patents, recognize that protection will encourage invention and innovation.

Studies of new products demonstrate the benefits of being first in presenting a new product on the market.[10] In the unpatented world, pioneer firms capture a relatively large market share during the first months of introduction. In short order, other firms duplicate the product and bid away much of the pioneer's market share from the pioneer firm. Sometimes it takes years for the pioneer to lose its initial standing as the largest firm in the industry, but the more competitive the market, the shorter the time it takes for this initial standing to erode. The initial standing serves to reward the pioneer for taking the risks and proving to the industry that this product is profitable to produce.

With CEI plans, there exist potentially smaller gains earned by BOCs as the initial risk takers. Other ESPs are not required to file CEI plans, which gives these firms the full benefit of the pioneer status. Although CEI plans may offer more assurance that the BOCs do not engage in access discrimination, they potentially destroy the gains necessary to introduce many new products. The CEI plans, therefore, can reduce consumer benefits through reductions in new product development while only potentially adding additional assurance that BOCs do not withhold access to LEC basic services. As administered, the CEI plans do not seem to have curtailed innovation, and today's innovations are being led by the BOCs. However, the potential exists in which CEI plan requirements can impede risk taking among the BOCs and eliminate the deployment of valuable enhanced services.

III. Alleged Benefits from Structural Separation

As outlined in the introduction, proponents of structural separation point to three potential benefits. First, the regulatory theory behind structural separation is based upon the presumption that with separated facilities and manpower among the BOCs, regulatory authorities will be more efficient in observing attempts by BOCs to discriminate in the provision of unbundled services and access. Proponents of structural separation argue that since the BOCs control LEC basic services, there is

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[10]See Urban, Glen L., Carter, Theresa, Gaskin, Steven, and Zofia Mucha, "Market Share Rewards to Pioneering Brands: An Empirical Analysis and Strategic Implications," *Management Science*, Vol. 32, June 1986, pp. 645-659.

substantial risk that certain unbundled services either will be withheld from the ESPs or will be provided on a non-equal basis, giving the BOCs an economic advantage in the provision of the affected enhanced services. Additionally, some services may remain unbundled even though the ESPs would bring new enhanced services to the marketplace if they had proper access.

Second, proponents see structural separation as a vehicle to protect the LEC basic service rate payer from the accounting abuses of paying for enhanced services. They claim that the current joint cost accounting allows the BOCs to move enhanced service costs into the regulated LEC basic service rate base.

Third, ESPs fear that not only will the BOCs shift enhanced service costs into the LEC basic service rate base, they will use the resulting windfall profits to subsidize the price of enhanced services, enabling the BOCs to monopolize the enhanced services market. This section investigates each of these three alleged benefits of structural separation.

A. Structural Separation and Assurances of Non-Discriminatory Access

Structural separation forces the BOCs to develop completely separate operations for the provision of enhanced services. It would place the BOCs on the same footing as the ESPs in the provision of enhanced services since a separate operation would be requesting LEC basic services rather than the integrated operation. Proponents of structural separation argue that the incentive of BOCs to engage in access discrimination would somehow be changed. Structural separation would help ensure equal access to LEC basic services and would presumably result in a more competitive market for enhanced services.

1. Access Discrimination is Prevented

Proponents of structural separation argue that access discrimination is a byproduct of integrated personnel and facilities. Presumably, with integrated operations and common goals, the BOCs will elect to engage in access discrimination whereas with structural separation such an election would not be made. The imposition of structural separation, therefore, would alter economic incentives.

In order to fully address these claims the issues of opportunity and incentive must be addressed. When, if ever, is it in the interest of the BOCs to access discriminate in the sale of LEC basic services? What economic advantage is to be gained from such access discrimination and what factors determine the extent, if any, of the discriminatory access advantage? To address these questions it will prove useful to view the BOC as a multi-product firm producing two products, LEC basic services and enhanced services. Since enhanced services are produced using LEC basic services as an input, the demand for LEC basic services is a function of enhanced services demand.

Proponents' arguments depend, in large part, on the presumption that the BOCs are monopoly providers of LEC basic services. If the BOCs were unconstrained monopolies in the LEC basic services market, and enhanced services were a downstream product, then the BOCs could obtain all of the monopoly rents by assuring that the enhanced services market is competitive. Given that the LEC basic service market is regulated, then the question arises as to whether or not there are additional profits to be had by differentially supplying LEC basic services to their own enhanced services unit versus other ESPs. However, as we shall demonstrate below, for this part of the problem, structural separation is no cure. The incentive to differentially supply LEC basic services would not be affected by whether or not the BOC enhanced services were supplied by an integrated or structurally separated wholly-owned subsidiary.

As a background to this discussion, it is important to consider changes in the market for LEC basic services. With changing technology, entry into the provision of LEC basic services is less difficult today. Some proponents of structural separation, such as MCI, are entering the market for LEC basic services. The discriminatory provision of LEC basic services to competing ESPs further encourages entry. Competing ESPs have the incentive and the ability to vertically integrate into the upstream market, eliminating the BOCs position as the sole suppliers. With new technologies on the horizon (and existing networking for major city business customers), the threat of entry in the larger markets is substantial.

The BOCs as the dominant suppliers of LEC basic services have in their hands a product that has experienced a large increase in value as a result of changing technology. For a century, the only two uses of the BOCs' wire connections have been as the supply of interconnections in the local exchange and as bridges to the long lines for long distance calling. Technological change has given

this old capital new opportunities while at the same time introducing competing resources. If the BOCs are to enhance or even maintain the value of their basic service connections, they must aggressively price and market them. Only through unbundling and ONA plan compliance will the BOCs maintain their position as the major suppliers of LEC basic services.

2. Necessary Conditions for Advantageous Discriminatory Behavior.

The purpose of this section is to identify the conditions necessary for discriminatory access to be in the interest of a BOC, where discriminatory access is defined as a BOC supplying competitor ESPs with delayed access or less unbundled LEC basic services than the timing or level of unbundling the same BOC supplies to its integrated ESP. These discriminatory access necessary conditions would have to be satisfied before discriminatory access would be an economically rational response to the entry of an independent ESP.

There are three necessary conditions for discriminatory access in LEC basic services to be in the interest of the BOCs: 1) regulation of local service prices must result in less than profit maximizing prices, 2) discriminatory access must result in increased revenues in the sale of BOC supplied enhanced services that more than offset the loss in revenues from restricted access, and 3) discriminatory access must be difficult to detect so that regulatory authorities and courts cannot impose corrective measures.

Necessary Condition 1

Economic theory argues that if a vertically integrated firm produces one product for which it possesses market power, it will maximize profits if the other market is perfectly competitive. That is, the firm will capture its monopoly profits in only one market. As applied to the BOCs, if prices in the market for LEC basic services equal profit maximizing monopoly prices, there is no incentive to restrict sales of LEC basic services to competing ESPs.[11] The BOCs will not maximize profits by

[11]There is existing debate regarding the incentive of a BOC to transfer costs from the provision of enhanced services to the provision of LEC basic services in order to overstate the rate base. The arguments presented herein assumes that the BOC knows the true costs of enhanced services and prices enhanced services on the basis of these true costs, regardless of the assignment of accounting costs.

restricting the provision of LEC basic services at profit-maximizing prices. However, the ability of a BOC to monopoly price in the LEC basic services market is subject to regulatory control. It is plausible that the BOCs are forced to price LEC basic services below the profit-maximizing price.

In order for discriminatory access to be profitable for BOCs, regulated prices in LEC basic services must be constrained below profit-maximizing prices. This condition is more likely to have been met in the past than in the present. Competition in the form of cellular technology, by-pass technology privately-owned switching equipment, and even future competition from the licensing of new FCC frequencies necessarily decrease profit maximizing prices in LEC basic services markets. It is not clear that **necessary condition 1** is currently met, and the likelihood that necessary condition 1 will be met in the future is less likely.

Necessary Condition 2

In order for the discriminatory access to be profit maximizing the loss in revenue from LEC basic services operations must be more than offset by the increase in revenues for enhanced services operations. How likely is such a result? We know from past studies that the elasticity of market demand for LEC basic services is very inelastic; this implies that the reduction in the quantity of LEC basic services demanded will be small if the BOC demand for LEC basic services is viewed as the market demand (the usual assumption because of the so-called monopoly position of the BOCs in the local market). But the market LEC basic services demand schedule is not the relevant schedule. Because of the increasing threat of local exchange bypass and other technological changes permitting entry, the elasticity of an BOC's demand for LEC basic services is much greater than the market demand elasticity. Other operators are ready to compete in the LEC markets.[12] Thus, the practice of discriminatory access can be expected to significantly impact LEC basic services demand. Even with regulation, a loss of LEC basic services market share will adversely affect the BOCs. In the long run the loss of market share will reduce capital and total profits. The retention of the BOCs' position

[12]The *Wall Street Journal*, April 3, 1995, reports an agreement between Ameritech and the Justice Department wherein Ameritech makes it easier for rivals to compete in its local markets in exchange for allowing Ameritech to enter the long distance market. Both long distance carriers and LECs are vertically integrating into existing markets.

in the LEC basic service market is critical to maintaining the value of their historical position in wired service.

The bottom line of the above discussion is that there is a declining probability that **necessary condition 2** will be met. Any BOC practicing discriminatory access will ultimately lose significant LEC basic services profits and lose value in its base resource without gaining significant enhanced services profits as compensation. In the long run, this condition is probably not met.

Necessary Condition 3

For a strategy of discriminatory access to be in the interest of any BOC, the BOC cannot live in a glass house. The likelihood of detection of discriminatory access must be minuscule under existing rules. The competing ESPs must not be able to detect any difference in LEC basic services purchased within the BOC and LEC basic services purchased among competing ESPs. No competing ESP must be able to detect significant delays in access once requests are filed. No competing ESP must be able to detect the establishment of cost-inducing protocols or more aggregate bundling that might be imposed by the BOCs. In essence, the competing ESPs cannot know that access discrimination is taking place.

In fact, with existing safeguards, BOCs provide access to LEC basic services from glass houses. ONA provides significant disclosure regarding available services and those LEC basic services demanded internally. Participation in industry meetings, such as the Information Industry Liason Committee (IILC), provide industry access to the BOC's staff who are unlikely to even know about alleged discriminatory corporate strategies. Competing ESPs occasionally employ former BOC technical staff as a means of capturing needed expertise and obtaining information important in developing their own corporate strategies. The industry evidence suggests that the BOCs do operate in glass houses, and that competing ESPs are quick to file allegations. In short, the BOCs operate in full view, surrounded by actual and potential competitors in the enhanced services market. Detection of access discrimination would be quick and promptly reported.

Once access discrimination is detected, competing ESPs are well supported with existing regulations and statutes. The deterrent to discriminatory behavior is twofold. First, the affected parties can and will submit complaints to the regulatory authorities who must continually review