

**An Analysis of the Value of IMS Medacom
to a Managed Care Organization**

PacifiCare (San Antonio, Texas)

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March 1998

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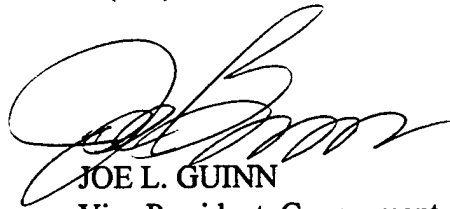
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SUBJECT: Submission of Graduate Management Project

Joe Guinn, Vice President for Government Affairs, PacifiCare, 8200 IH-10 West, Suite
1000, San Antonio, TX 78230 28 Feb 98

FOR U.S. AMEDD Center and School, Bldg 2841 MCCS-HRA (Rene L. Pryor), 3151
Scott Road, Fort Sam Houston, TX 78234

1. I have reviewed with pleasure the Graduate Management Project completed by
MAJ Vivian Hutson for the U.S. Army-Baylor University Graduate Program in
Healthcare Administration. The project addresses an important issue at PacifiCare, but
will also be a great contribution to the field of health care administration. The paper is
professional and scholarly, yet practical.

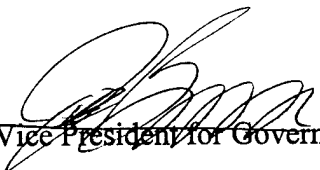
2. If you have any questions, please call me at (210) 524-2108.

A handwritten signature in black ink, appearing to read 'Joe L. Guinn', is positioned above the printed name and title.

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28 February 1998

MEMORANDUM THRU  Joe Guinn, Vice President for Government Affairs, PacifiCare

FOR U.S. AMEDD Center and School, Bldg 2841 MCCS-HRA (Rene L. Pryor), 3151
Scott Road, Fort Sam Houston, TX 78234

SUBJECT: Submission of Graduate Management Project

1. In accordance with the instructions contained in the Administrative Residency Manual, this Graduate Management Project (GMP) is submitted by MAJ Vivian T. Hutson, Administrative Resident, PacifiCare.
2. The GMP is entitled "An Analysis of the Value of IMS Medacom to a Managed Care Organization." The project considers the relationship between PacifiCare and the operator of a community health information network in San Antonio, Texas. While the study is meant to be of specific and immediate use to PacifiCare, it is my intention that the themes addressed and the data that I gathered and analyzed will be of use to any health care organization in maximizing the value derived from its information systems.
3. Please address any comments to me at (210) 979-2304.



VIVIAN T. HUTSON
MAJ, SP
Administrative Resident

Running head: VALUE OF IMS MEDACOM

**An Analysis of the Value of
IMS Medacom
to a Managed Care Organization**
A Graduate Management Project by
MAJ Vivian T. Hutson
U.S. Army – Baylor University

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This project would not have been possible without the support and assistance of many different persons. Joe Guinn, PacifiCare's Vice President for Government Affairs, opened doors at PacifiCare and elsewhere and contributed his valuable perspective on the inner workings of the health care industry. Colonel Joseph Gonzales and Lieutenant Colonel Sandy White helped me to plan a coherent strategy for getting the maximum benefit from my administrative residency and then trusted me to carry out that plan. Lieutenant Colonel David Heier encouraged me to expand my thinking beyond conventionally accepted paradigms while helping me to remain firmly grounded in practicality. The Information Systems Department at PacifiCare, especially Bradley Fluitt and Sandy Maulden, gave me free access to their vast experience, superior knowledge of communication systems, and very good sense. I could not have fully addressed the issues of this project without their unselfish assistance and without the openness of many other people at PacifiCare. I cannot fully express my appreciation for the help that each of my superiors and colleagues freely offered. Finally, I would like to thank my family, especially my husband and my parents, for their unflagging support, their confidence in me, and their understanding when I too deeply involved in work to talk of anything else.

Abstract

IMS Medacom is a privately owned, multiple subscriber, community health information network that has independent systems in metropolitan areas throughout the United States. Shared computer networks of this type have become increasingly common in this country and in Europe as the health care industry has worked to cut costs and increase efficiency by reducing paperwork, speeding communications, and automating management tasks. IMS Medacom is provided as a free service to physicians, with its cost being borne by national and local sponsors. Most of the sponsors are integrated hospital systems but there are also some managed care companies, including, in the San Antonio area, PacifiCare, a large HMO. This paper assesses whether the benefits that PacifiCare receives from the sponsorship of this service are worth the cost. Surveys of PacifiCare-affiliated physicians and of practices that subscribe to IMS Medacom, and the review of transaction reports of actual usage patterns, show that IMS Medacom was used by a minority of the area's physicians and those that did use it were much more likely to use the hospital-related functions of the system than they were to use PacifiCare's functions. Expected cost savings to PacifiCare from its use of the system were small and unlikely to actually accrue. A competing HMO that derived much greater use of the IMS Medacom system had a different way of managing health care and was better able tailor its operations to the system because it uses the service in many different markets. PacifiCare already has excellent means of communication and realizes little or no benefit from sponsoring and using IMS Medacom. The costs of sponsorship far outweigh the benefits that the company receives in return.

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Introduction

The Growth of Medical Paperwork

Physicians, nurses, and other health care professionals have complained for many years that their time is increasingly taken up by the administrative duties of filing reports, billing, and completing an ever-expanding array of forms. Most of the changes that the health care industry has been through in the last half century have contributed to this growing burden of paperwork and the increased need for different medical organizations to communicate with each other.

The increased sophistication and technology involved in medical care mean that fewer patients are treated by physicians working alone. Referrals are made to specialists and patients are sent to allied health care professionals for treatment or counseling. X-rays and laboratory tests are seldom performed in doctor's offices any longer, but are instead done at hospital facilities or, increasingly, at stand-alone centers (Szeinbach & Sherrin 1996). Each of these transactions will normally require both referral documents and written reports back to the lead physician. When reports are returned by mail or courier, significant delays in treatment can result.

The prevalence of third-party payers, whether private insurers or government programs, has complicated the billing process. Different payers require that different information be submitted using different forms. Many managed care programs will require preapproval of certain procedures, which are necessarily delayed while the proper forms are completed, transmitted, considered, and returned (Gustafson, 1996).

The growth of health maintenance organizations (HMOs), might have been expected to reduce the trend toward more paperwork by bringing the full range of health

care professionals into a single organization, or even into a single building, in which communication could be much easier, quicker, and less formal. As HMOs have become the predominant vehicle for medical coverage, however, they have largely changed from closed systems that operated their own facilities and employed physicians directly to open plans that contract with various hospitals, physicians, and others (Kongstvedt, 1996). Today, a typical physician in either solo or group practice will see patients from a variety of health plans, some operated by HMOs and some not. Hence, the physician must deal with a variety of reporting requirements and claims procedures.

Other trends have generally increased paperwork and the need for communication between medical organizations. These include the more apparent need to protect against malpractice suits, the greater mobility of patients (who may need to take detailed sets of medical records with them), the increased use of pharmaceuticals, and the addition of nonphysicians, such as physical therapists, occupational therapists, and dietitians, to the medical team (Tonneson, 1996). Today's physician needs much more than the traditional handwritten journal and prescription pad.

There are, of course, modern office tools to help deal with the increased paper flow (Richardson, 1994). Word processors and laser printers can take much of the drudgery out of filling in forms. Facsimile machines speed up the transmission of reports. Photocopiers have largely replaced carbon paper, and Internet electronic mail (E-mail) can sometimes replace the letter carrier. Each of these technologies has limitations, however (Ellenberger, 1995).

IMS Medacom

A system that attempts to overcome many of these limitations, and to generally ease medical organizations' paperwork burden, is a telecommunications service provided by Integrated Medical Systems (IMS). The service, IMS Medacom, is designed to electronically link health care organizations and providers within a geographic area to allow easy communication and transfer of information. It includes the ability to send general messages (similar to Internet E-mail messages), to create documents and forms, and to transfer documents and data files to other users. The recipients may further process or add to the documents or data files without retyping them into their computer systems.

IMS Medacom is designed specifically to serve the medical community and has a number of features that distinguish it from other electronic communication systems. Most significantly, it is provided without charge to physicians within the geographic area. The costs of establishing and operating the system are borne by national and local sponsors. These sponsors are generally large health care organizations, such as hospital chains or managed care companies, that stand to benefit from better communication with and between providers. Physicians and some smaller health-related organizations, such as pharmacies or laboratories, are eligible to subscribe to the service if they are affiliated with a sponsor.

IMS Medacom is, therefore, not the proprietary network of a particular health care organization, but a common system for communication between many different organizations. Ideally, physicians and their staffs would need to learn only one communications system, even if they treat patients from many different health plans.

This degree of standardization would only be achieved, however, if most or all of the large health care organizations in the community adopted the use of IMS Medacom, and in essentially the same format.

The incremental saving from using IMS Medacom for a particular communication, instead of more traditional methods, is likely to be rather small. The physician's office might save a few seconds or minutes in not having to transfer between different systems, some training time could be saved, less time would be spent at the facsimile machine, and fewer documents would have to be retyped. The question that must be answered is whether the sum of these small savings is sufficient to justify the expense of establishing and operating the network. This question should be examined in light of both the benefits that could accrue if the system is used to its greatest potential and the benefits that result from the way the system is actually used in a particular organization or setting.

Literature Review

Healthcare is information intensive, but it still relies largely on manual systems, such as the medical chart, to store patient information. As an industry, the health care system has invested a relatively small percentage of budgets in information technology (Bolley, 1994). The growth of managed care, with its emphasis on utilization control, has placed much additional emphasis on the need for enhanced information systems. In fact, many of the predicted cost savings and efficiencies from managed care depend closely on improvements in automated information management and integration (Friedman, 1996).

The need for integrated information technologies and improved information management tools in the health care industry is apparent from the high cost and inefficiency of current paper-driven processes. Between 20% and 30% of the nation's health care expenditures are associated with informational paperwork for the hundreds of millions of transactions that take place every month (Council on Competitiveness, 1996, November). A recent study showed that at one site, physicians spent 35% of their time, and nurses 50% of their time, doing paperwork. The Council on Competitiveness estimates that as many as 13% of the over one billion medical claims filed annually are returned for error correction.

A wide variety of articles have been published in professional journals concerning the development of electronic medical data systems and their implications for different parts of the health care profession. Besides the need for cost savings, the many demands made upon physicians by the government, third party payers, hospitals, and others have driven the need to adopt automated systems (Richardson, 1994). These data systems have been fielded in many different forms, with varying degrees of sophistication, and under many different names.

A typical progression has started with the development of an enterprise computer network, linking the various departments of a hospital or other health care organization (Friedman, 1996), or between two adjacent hospitals comprising a tertiary care medical center (Legler and Oates, 1993). While these systems facilitate communications, they are confined to the particular enterprise and generally have minimal integration of information. A more evolved system than the enterprise network is the integrated delivery system (IDS) computer network (Friedman, 1996). The IDS network is

developed to facilitate information management between the affiliated and contracted parties of an organization or health care network. An IDS network will normally include a data repository as an additional feature.

Friedman uses the term "community health information network" or "CHIN" to describe a fully evolved data network that differs from enterprise and IDS networks in that it is owned by an independent entity and is available to provide health information to all organizations in the region. A developed CHIN allows for the costs of information switching, storage, and processing to be borne by a number of organizations. It allows for a more consistent and comprehensive linking with affiliated and contracted entities. It is more likely than an enterprise or IDS network to include allied and ancillary health care organizations such as laboratories and pharmacies that serve the entire community. The 56 regional networks operated by IMS Medacom are examples of CHINs (Integrated Medical Systems, 1997).

In their extensive book, Management Information Systems: Organization and Technology (1994), Kenneth C. Laudon and Jane P. Laudon use the term "value-added network" or "VAN" to describe a private, multipath, data-only, third-party-managed network used by multiple organizations on a subscriber basis. A community health information network such as IMS Medacom is an example of such a value-added network. The Laudons explain that the term "value-added" refers to the extra value added to communications by the telecommunications and computing services these networks provide to their subscribers. Users do not have to invest in network equipment and software or perform their own error checking, editing, routing, and protocol

conversion. Economies of scale allow subscribers to achieve savings in line charges and transmission costs.

Use of a multi-subscriber VAN achieves particular cost savings over the use of independently-owned or leased transmission lines. A single firm might use its line heavily at certain times and then leave it idle for long intervals in between. VANs use the process of "packet switching," which breaks blocks of text into small bundles of data that can be routed through communication channels in the most economical way. While this process is not suitable for the transmission of real-time voice or video messages, for text data it enables communication facilities to be more fully utilized by more users (Laudon & Laudon, 1994). IMS Medacom uses normal telephone lines, avoiding the expense of dedicated channels. This makes the economies of packet switching less compelling, but still considerable, in that the process shortens transmission times and makes more efficient use of centralized switching and recording equipment.

The Laudons conclude that VANs are best used for "moderate-speed, high-volume, frequent long distance communications when organizations do not need to manage their own telecommunications." Pertinent questions when deciding whether health care organizations should adopt the use of a VAN are, therefore, whether there is sufficient traffic volume between potential users to justify the expense, particularly for local communications, and whether the organizations need to manage their own communication systems.

Another consideration in the adoption of VANs for the transmission of medical data is the need for security, or at least for confidentiality. This is a theoretical weakness of shared networks because one user's data can be mixed in with data from other users.

In practice, however, few problems of this sort have been reported (Laudon & Laudon, 1994). A greater potential security risk, in the case of IMS Medacom, is the use of ordinary telephone lines to transmit the data. Such lines are vulnerable to interception or even accidental transmission to the wrong user (Bolley, 1994). There are security measures that can be taken to address this weakness, however. Further, the use of the public telephone network for data transmission is in some ways less risky than the use of dedicated lines (Austin, 1988). Certainly there is a greater chance that a single line or group of lines will be physically disrupted or disconnected than there is of losing the ability to transmit through the telephone system, with its vast number of available channels and built in back up systems.

As health care organizations adapt to the new practices and opportunities of the managed care environment, they are finding that increased investment in information systems, whether in-house or out, has become a virtual necessity. Organizations that are entering into capitation arrangements have a particular need for more capable information systems (Fox, 1996). Not only must they upgrade their systems in order to control their costs and manage their organization's patient care, but they must also handle data from outside. Risk contracts require access to all of the membership data, utilization statistics, and costs associated with each contract. This involves access to a health plan's membership and to services provided by participating physicians, nonparticipating providers, and subcontracted providers.

Electronic data interchange, or EDI, is a service that is often offered by valued-added networks and which can be particularly useful for the managed care organization. This is one of the primary features of IMS Medacom. EDI is the direct computer-to-

computer exchange, between organizations, of standard business transaction documents (Laudon & Laudon, 1994). EDI saves money and time because transactions can be transmitted from one information system to another through the telecommunications network, eliminating the printing and handling of paper at one end and the re-inputting of data at the other.

Electronic data interchange differs from electronic mail in that it transmits an actual structured document, with distinct fields specifying the data entered, rather than an unstructured text message such as a letter. IMS Medacom refers to this kind of interchange as a "scripted message," as opposed to a "general message," its term for electronic mail. One objective of EDI is to convey the minimum amount of data which will result in correct, timely action with the minimum risk of error (Love, 1995). The use of a set format makes the handling of information simpler and helps to avoid errors caused by misinterpretations. In many cases, the subsequent processing of the data can be done by computer software without further human input.

Electronic data interchange lowers routine transaction processing costs because there is less need to transfer data from hard-copy forms into computer-ready transactions (Laudon & Laudon, 1994). EDI reduces transcription errors and associated errors that occur when data is repeatedly entered and printed out or when a form is sent and re-sent by facsimile machine. For EDI to work, the different organizations that use it must agree upon a single transaction protocol, since different EDI standards exist which are not mutually understandable. IMS Medacom provides a standard protocol that could further the use of EDI among a community's health care organizations. There is the further question of standardizing forms and documents between organizations. IMS provides

this service to its sponsors and subscribers in the form of "scripts" (IMS, 1997).

Standardization may not be complete, even then, if different sponsors do not use the same scripts. Thus, a physician may use the EDI feature of IMS Medacom to file claims with several different health plans, but may need to follow a different script for each plan.

IMS, in many cases, charges a fee to its sponsors for the development and implementation of new scripts.

One of the most important and resource-heavy functions of a managed care company is the processing and paying of claims for medical care provided to their members. Claims payers must have systems that will allow them to adjudicate and pay claims from both member and nonmember providers (Gustafson, 1996). Claims adjudication is very labor intensive since it can require benefit level and coverage determination, investigation of claims involving pre-existing condition limitations, payment to multiple parties, and the creation of records useful for utilization review (Fox, 1996). Electronic data interchange can lower the cost to payers through three principal efficiencies: electronically submitted claims can be efficiently edited by claims submission software; costly and error-prone re-transcription can be eliminated; and sophisticated claims payment systems can "auto-adjudicate" most simple claims (Gustafson, 1996). The claims process is also made more efficient through the integration and exchange of claims and clinical data, such as patient history, diagnosis, and medication records (Szeinbach, Taylor & Sherrin, 1996).

A surprisingly important use for electronic data interchange systems in the health care community is the determination of patient eligibility for treatment. With so many competing health plans, and the frequent shifting between plans that many patients do, it

has become increasingly important for providers to have very up-to-date information on the terms of a patient's coverage (Bierstock, 1995). This includes information about the list of authorized providers, the copayment terms, and the types and amounts of treatment covered. Medical services provided to ineligible patients may constitute an enormous loss of revenue to a practitioner. Many insurance carriers now distribute eligibility information on tape, diskette, or by modem transmission to their participating providers. In these cases, the software used by the provider must be compatible with the format in which the information is supplied. Usually, eligibility information is provided monthly, but even if it is provided bimonthly or weekly there is still the very real possibility of patients obtaining services, for which they cannot pay, in the period just after their eligibility ends. A real-time, instantaneous means of confirming eligibility has obvious advantages.

In Europe, EDI is expected during this decade to become the dominant form of business communication between companies in several different market areas (Doukidas, Pallikarakis, Pangalos, Vassilacopolulos & Pramataris, 1996). It is viewed in the international business community as enabling the integration of applications, the implementation of strategies such as "just-in-time" supply, and the creation of "virtual corporations." In the health care sector, EDI technology was first applied in Europe to the purchase process and then expanded to other areas, such as claims reimbursement, telemedicine, and administration. Great emphasis has been placed upon message standardization. Among other advantages, this helps to resolve or avoid differences resulting from the use of different languages and the variety of conventions in medical documentation. Much of the European Community has adopted a message standard

called MEDEUR for integrated patient data exchange between computer-based recordkeeping systems (Branger, van't Hooft & van der Wouden, 1995). MEDEUR structures not only physician, patient, and hospital information, but also the medical data needed for the shared care of a patient by different physicians. It can be used for the transmission of a complete medical record or sections of one.

A novel use of EDI is as part of the European-wide Medical Device Vigilance System (MDVS) that was created to monitor the occurrence of medical device failure and to aid in the investigation of such incidents by both manufacturers and regulatory bodies (Doukidas, Pallikarakis, Pangalos, Vassilacopolulos & Pramataris, 1996). The system requires a considerable amount of regulatory data to be stored and communicated between government agencies, medical standardization organizations, manufacturers, hospitals, and the European Commission. EDI has several advantages as the system to accomplish this, including, most interestingly, the ability to use automatic language translation routines. The system is still under development, but the final product is expected to allow national governments and other interested parties to participate in the MDVS system even though they may have widely different information systems and processes.

Improved communication of data, whether through EDI or other means, can help to boost the efficiency of providing health care in other ways. Both primary care providers and specialists benefit from the greater speed and accuracy in the dissemination of the results of laboratory tests and consultation reports. Radiologists benefit from the transmission of CT scan and digital X-ray images (Richardson, 1994). Faster feedback to primary care providers allows them to complete their diagnoses and begin treatment

sooner than if they had to wait for a report to be manually carried from the specialist to a transcriptionist and from there to the physician. An up-to-date electronic record of test results also helps to eliminate unnecessary duplication of tests ordered by different providers.

Speed of reporting is further increased when providers make entries into the data system themselves, rather than relying on transcriptionists to interpret their dictation or handwritten notes. One survey found that in more than three quarters of medical practices that used automation equipment, administrative or nursing staff transcribed the doctor's notes, in effect recording the information twice (Wynekoop & Finan, 1994). Another study found that while provider data entry was expensive, it reduced transcription costs, speeded the process, improved legibility of the patient record, and furthered communication between providers and with patients (Miller 1996). Two studies found that patients did not have negative reactions to providers making data entries during the treatment session (Legler and Oates, 1993; Solomon and Dechter, 1995).

Ultimately, the benefits of integrating medical data from different sources in an easily accessible real time format will go beyond increasing the efficiency of the claims process and result in improved patient outcomes (Szeinbach, Taylor & Sherrin, 1996). Physicians and staffs will spend less time with paperwork and be able to devote more time to patients. Less time will be spent looking and calling for test results or interpreting illegible notes. Chart information will be consistently available because it will not be sequestered in another area. One study found that paper charts are unavailable 30% to 50% of the time (Tonnesen, 1996).

Another potential benefit would be the improvement in the type and amount of information available to different members of the health care team. For example, expanding the current electronic links between pharmacies and pharmacy benefit managers (PBMs) to include physicians would improve the physicians' access to drug utilization review information and the latest changes in group formularies (Segedin, 1995). This would likely improve both the accuracy and effectiveness of the physicians' prescription writing. Physicians could determine, for example, whether patients are actually purchasing the medicines that have been prescribed. Similarly, a shared medical information system could give specialists and allied health care providers access to pertinent information about a patient that is contained in the primary care provider's more extensive records. Primary care providers could better monitor their patients' treatment by the specialists or therapists to which they have been referred.

One of the principal concerns about using shared communications networks to serve the medical community is the need for security to preserve patient privacy (Frisse, 1996). This is particularly true for Internet-based technology, which might be accessible by an extraordinary range of unauthorized users. Automated systems may leave patient information vulnerable to loss, manipulation, unauthorized access, and misuse. The further integrated a system is, the more potential there is for security breaches (Bolley, 1994). Medical systems therefore must have means of protecting confidentiality, as well as back-up procedures, and disaster recovery plans.

There are many telecommunications options available today and the technology is constantly changing along with its related costs. The Laudons recommend that

organizations take eight factors into account when choosing a telecommunications network (1994). These are:

1. *Distance.* Communications may be largely local or long distance and internal or external to the organizations. Local, internal traffic is unlikely to need leased lines or VANS.
2. *Range of services.* One must consider what services (such as electronic mail, EDI, internally generated transactions, voice mail, videoconferencing, or imaging) will be needed and whether they should be integrated into the same network.
3. *Security.* The Laudons stress the physical risk of the communications lines, and particularly whether they are company-owned, leased, shared, or public. They do not discuss other security features such as encryption, firewalls, and other safeguards that may be equally as important.
4. *Multiple access.* A system that has several thousand users may call for the use of commonly available technology, such as telephone lines, while a system limited to fewer than 100 high-intensive users may be structured with one or two nodes and use more advanced, higher-speed technology such as fiber optics or a broadband local area network.
5. *Utilization.* The two aspects of utilization to be considered are the frequency and the volume of communications. Together, these determine the total load on the telecommunications system. A system should have sufficient capacity to carry the load, but a system with unnecessarily high capacity may be expensive and unreliable to operate.

6. *Cost.* Total cost includes costs for development, operations, maintenance, expansion, and overhead. The Laudons contend that underestimating the cost of telecommunications projects and failing to control telecommunications costs are principle causes of network failure.

7. *Installation.* This largely deals with the difficulties of installing the necessary lines between communication stations.

8. *Connectivity.* This deals with what will be required to make all of the components in a network communicate with each other or to tie together multiple networks. Different standards for hardware, software, and communication systems may make it difficult to get the different components to "talk" to one another.

Despite the many potential advantages of adopting integrated information systems, the health care industry as a whole has yet to embrace this technology. The industry may be slow in integrating information-based systems for a variety of reasons (Council on Competitiveness, 1996, November). First, the purchasing environment for information systems is fragmented in many health care organizations. The number of available choices, the rapid rate of product obsolescence, the variance in the reliability of vendors, and the absence of clear market leadership may confuse organizations. Second, a proliferation of proprietary financial and administrative systems, on the part of both providers and payers, has made it more difficult and costly to establish effective communication and integration. For example, Humana, a national HMO that contracts with more than 38,000 providers, uses a variety of practice management systems within its organization. The sheer number of different systems, differing programming priorities of vendors, and lack of data standards hamper its attempts at integration. Humana has

become a national sponsor of IMS Medacom largely in an attempt to overcome these difficulties. Third, there is lack of well-defined business incentives to invest in integrated systems. Traditionally, health care organizations have not operated in the kinds of enterprises that are developing today. Practitioners have not seen the benefit of moving beyond paper-based systems and have therefore been reluctant to make the necessary investments in time and money. Unless many parts of the system make similar commitments to new technology, it is difficult for the "early adopters" to realize value for their investment in new systems.

Another study (McCarthy, 1997) bluntly posed these questions about networking physicians and health plans: will doctors really use the technology? and, who will pay? It concluded that doctors are likely to change their practice behavior to incorporate use of an information network only if they could see benefit to their patients or to their bottom line. As a rule-of-thumb, the risk-bearing entity will normally bear the cost of installing and maintaining the system, because that is generally who is also collecting the premium dollar. Risk-bearing entities might be HMOs, management service organizations (MSOs), or, for systems linking physicians, pharmacies, and pharmacy benefit managers together, the PBMs.

Three fundamental issues that must be addressed to realize the market potential of integrated health information systems are: (1) concerns over privacy, confidentiality, security, and compliance with state and federal laws pertaining to these; (2) the need for standards in information content and networking; and (3) the need for ways to quantify benefits in terms of objective cost-benefit analysis (Council on Competitiveness, 1996, December).

The medical literature reports numerous successful creations of integrated health information networks, including implementation of the IMS Medacom system in many communities. An IMS Medacom system that already served the 900 physicians of the University of Minnesota was expanded when Blue Cross and Blue Shield joined as an additional sponsor (Borzo, 1994). In that case, the university system sponsors applications to facilitate physician referrals and the "Blues" sponsor applications for a physician directory, drug formularies, and referrals. This article notes that sponsors typically do not use the networks to replace electronic claims filing systems, but instead concentrate on clinical uses, especially managing referrals and reporting laboratory results. The system has been successful in consolidating the variety of proprietary systems used by different laboratories into a single standard, eliminating the need for an office to maintain multiple terminals.

Another article noted the success of systems linking physicians to hospitals, which allowed, for example, doctors to receive lab results via their home computers in the middle of the night or to access X-rays and lab results from their offices away from the hospital (Berman, 1993). The article found growing support for systems, such as IMS Medacom, that go beyond the hospital-physician connection to include other practitioners and health care entities. This largely springs from a need for faster access to both clinical data and insurance information. The features of IMS Medacom that have received the most favorable comment are its open architecture that even allows communication between competing organizations, the capability for electronic signatures, and store/forward design that allows physicians to receive information from other users but does not allow them to access the other companies record system. This last feature is

considered to be an important point in overcoming physician concerns about patient confidentiality.

Patient confidentiality was also cited as an advantage of the IMS Medacom system over Internet-based systems by new users of the south Florida network (Hopkins, 1995). Also, physicians reportedly appreciated the ability to schedule laboratory tests, obtain laboratory results, send prescriptions to pharmacists, and coordinate work between different physicians treating the same patient, without spending a great deal of time on the telephone. The sponsors of the south Florida network were three hospital systems and Humana Health Care Plans of South Florida. The sponsorship contracts with IMS are for five years, with the hospitals being charged according to their number of beds and Humana, as a managed care system, having its charge based on enrollment. A spokesman for IMS Medacom South Florida said his organization had documented savings at individual hospitals of about \$400,000 per year, due to reduced paperwork costs. Other users of the network include national pharmacy chains and, most recently, a durable medical equipment supplier.

An article about the IMS Medacom network in Indianapolis noted that potential sponsors for the system included "HMOs, preferred provider organizations, hospitals, clinical labs, pharmacies and medical billing service, as well as national health care companies such as Eli Lilly and Co., SmithKline Beecham Corp., Humana and PCS" (Miller, 1995). The only actual sponsors of the Indianapolis network, however, were four local hospital systems, one of which was a minority shareholder in the corporation operating the network, along with IMS. As in other IMS networks, the sponsors pay an annual fee and physicians who are affiliated with the sponsors only need a modem-

equipped computer to join. There is no per-transaction charge, since the success of the system depends upon its heavy use. Messages can be transmitted 24 hours a day, seven days a week, without interruption of other computer use.

When Chicago-area hospital and physician associations attempted to form a community health information network starting in 1994, that effort eventually collapsed (Health Data Network News, 1996). One of the hospital companies that was participating in that project, Advocate, decided, however, to continue forward by implementing the IMS Medacom network system, which it had tested as a key potential piece of the Chicago CHIN. The system now links Advocate's eight hospitals. It is used primarily for the transmission of clinical information and referrals and to coordinate scheduling. Advocate hopes to eventually transmit financial information to payers through the network, but that is not a priority since its hospitals already have other electronic links to payers.

Purpose of Study

IMS Medacom is designed and marketed as a system to link health care organizations and providers. The service is paid for by the larger health care organizations that are national or local sponsors; individual physicians receive the service (software, training, and access) free of charge. This project was to determine whether the benefit to the sponsors (and to one sponsor, PacifiCare, in particular) is worth the cost that they bear.

The study examines the San Antonio, Texas, market, in which there are presently four local sponsors for IMS Medacom—Humana (which is also a national sponsor), Santa Rosa Hospital System, Baptist Health System, and PacifiCare. Humana and

PacifiCare are HMOs that contract with health care providers to provide care to their members. Santa Rosa and Baptist are integrated hospital systems, each with several facilities in the San Antonio area. Over 2,000 physicians are connected to the San Antonio IMS Medacom network.

The study focuses especially on the benefits that PacifiCare receives from its participation in the IMS Medacom system. While quantifiable information was used whenever possible, the nature of PacifiCare's business means that much, perhaps most, of the return on its investment in IMS Medacom is nonquantifiable. This is partly because PacifiCare, in the San Antonio market, is gradually moving out of the business of paying claims or of actively managing the care of most of its members. Rather, it is contracting with a number of medical groups to serve as primary care providers and to bear some or all of the capitated risk of patient care. To different degrees, the medical groups actively manage patient care, often including the approval of specialty treatment, conducting utilization management, and (at least partially) paying for secondary health services. For some of its members, however, including most of the ones living in the rural surrounding counties, PacifiCare still purchases care from providers on a fee-for-services basis, and therefore directly performs the managed care and claims paying roles.

As in almost any real-world business situation, PacifiCare's actual business practices are complicated and constantly changing. For a growing number of its members, though, PacifiCare does not especially benefit from IMS Medacom's ability to speed communications between specialists and primary care providers or to simplify the claims process. Cost savings from the system, if any, would chiefly accrue to the individual providers and to the medical groups that bear the capitated risk of care. A

primary benefit to PacifiCare would appear to be from the use of IMS Medacom as an incentive to physicians and medical groups to become part of the PacifiCare network of providers. PacifiCare's revenues come from providing group health coverage to employers and individual coverage to Medicare-eligible persons. Having a large number of providers in its network is a major factor in making PacifiCare attractive to employers or individuals selecting a health care plan.

The project attempted to determine what benefits PacifiCare derives both from its own use of IMS Medacom and as a tool to recruit physicians to its network. The benefits are then compared to the price that PacifiCare pays for the service. This study is particularly relevant for PacifiCare, since the San Antonio area is the only market (out of 26 PacifiCare markets in 14 states) in which PacifiCare has become a sponsor of IMS Medacom. The results, as determined by this study, should play a role in PacifiCare's decision of whether to participate in the system elsewhere as well as whether it should continue or alter its relationship with IMS in the San Antonio area.

Methods and Procedures

A variety of quantitative and nonquantitative methods were used to measure the benefits that PacifiCare derives from its sponsorship and use of the IMS Medacom system. These methods were: (1) use of IMS and PacifiCare transaction reports; (2) a targeted survey that I conducted of PacifiCare-affiliated physicians; (3) other surveys conducted recently, including an IMS Medacom customer satisfaction survey, a survey of attendees at an IMS Medacom users appreciation conference, and a PacifiCare provider satisfaction survey; and (4) an analysis of potential PacifiCare employee time and cost savings.

Transaction reports were analyzed to determine the way that the medical community is actually using IMS Medacom. The reports prepared by IMS measure the number of different types of transactions (e.g., eligibility checks, general messaging, file transfers, etc.) performed by each user. The reports were also used to determine who is using the system: whether it is mostly primary care providers or specialists; individual physicians or hospital departments; many different users or just a few. I specifically looked at what PacifiCare-sponsored functions were being used by providers and how the number of these transactions compared to the number of transactions involving functions sponsored by other organizations.

I conducted a targeted survey of physicians in the PacifiCare provider network that currently are subscribers to the IMS Medacom system. The survey was conducted in January 1998 and was designed to learn how the providers were using the system and what their overall level of satisfaction was. A copy of the questionnaire is at Appendix B. I called each of the 132 practices that are PacifiCare-sponsored subscribers to IMS Medacom, before sending the survey via facsimile machine. I hoped that making the calls would help increase the percentage of surveys that were completed and returned. I asked office managers to complete the survey and to return it to me by facsimile machine.

I had considered conducting the targeted survey using the IMS Medacom system itself, but found that this was not a practical method. If the survey questionnaire were sent to providers as a general message (i.e., an unformatted text message), the recipients would not have been able to simply use their computers to fill in the answer spaces and then to return the survey through the network. The general messaging functionality does not allow additions (such as the filling in of blanks on a questionnaire) to be made to a

message. I could have used the scripted message functionality, which would have allowed the office managers to answer questions by filling in the specified data fields and to return it to me over the IMS Medacom system. This option would even have allowed me to automatically store the responses in a database and to use spreadsheets to draw upon and tally the data. I found, however, that programming a scripted message for the system would require a considerable effort by a person trained in the process. While this might be a worthwhile investment for the creation of a standard business form that would be used for a long period of time, it was not cost effective to pay IMS to create a script just to conduct this survey. Again, I could have sent the questionnaire as a general message and asked the office managers to print it out, complete it and to send it back via facsimile machine, but I expected that the more involved the process was the fewer responses I would receive. I designed the survey to be easy to complete and I limited it to two pages, hoping that the recipients would be able to fill it in and send it back the way they had received it, and not lay it down to be possibly done later.

After receiving the surveys, I conducted a cross check of the responses received from the practices and the information about their actual use of the IMS Medacom service contained in the IMS transaction reports. I did this to discover how accurate the self-reported information was and to correct for any tendency on the part of survey respondents to "say what they think I want to hear."

In January 1998, IMS conducted a customer satisfaction survey of all of the physicians that it services in the San Antonio area. The survey was conducted through the IMS Medacom service and asked for details of usage, choices as to how the system can be improved, and levels of satisfaction with different parts of the service. In

November 1997, IMS surveyed the persons attending its semiannual IMS Medacom Users Appreciation. In 1995 and 1996 PacifiCare surveyed providers through its western and southwestern markets about their level of satisfaction with the company. The information from these various surveys was an interesting addition and counterpoint to the data collected through the targeted survey and transaction reports.

Finally, by determining the amount and way that IMS Medacom is used within PacifiCare itself, and the cost or time savings that are engendered thereby, I attempted to measure direct financial benefits to PacifiCare. I tried to identify the maximum potential savings that could be achieved if the company used IMS Medacom to the greatest possible extent and was thereby able to replace some other means of communication. I only considered capabilities that are available to PacifiCare under its current contract with IMS or which could be easily added without changing the scope of the agreement.

The Results

Analysis of Transaction Reports

A. IMS Medacom Transaction Reports.

PacifiCare has been a participant in the IMS Medacom San Antonio network since October 15, 1996. In the original contract, dated March 31, 1996, IMS agreed to have installed the network at 100 subscriber sites (offices of physicians affiliated with PacifiCare) by the end of calendar year 1996, at 200 subscriber sites by the end of calendar year 1997, and at 400 subscriber sites by the end of calendar year 1998. IMS is well ahead of this schedule, having enrolled 468 PacifiCare-affiliated physicians as of the end of December 1997. Of these, 422 have full two-way communication via modem-equipped computers and 46 have only the capacity to receive messages from IMS

Medacom over their facsimile machines. PacifiCare is affiliated with 1,488 San Antonio area physicians (320 primary care providers and 1168 specialists).

In the entire area served by IMS Medacom San Antonio, there are approximately 4,000 physicians, about 2,600 of who are affiliated with one or more of the four network sponsors. Of these, 2,071 physicians, at 482 sites, were subscribers to IMS Medacom as of the end of December 1997; 1,795 subscribers had full two-way communication. This represents a growth from 1,510 subscribers at the end of 1996, 559 subscribing physicians at the end of 1995, and only 190 enrolled physicians in January 1995.

Physicians continue to be added to the network at a rate of about 40 – 50 per month.

Table 1 shows the volume of message traffic of all kinds for the IMS Medacom San Antonio network and the number of PacifiCare-specific messages sent, broken down into the various types of messages, for the four most recent months. (Only PacifiCare-sponsored subscribers may send or receive these messages.)

	<i>Dec 1997</i>	<i>Nov 1997</i>	<i>Oct 1997</i>	<i>Sep 1997</i>
Total Network Msg. Vol.	156,052	148,916	173,231	147,656
Eligibility Downloads	940	1,183	3,934	629
Requests for Referral	1	7	22	7
Member Concern Reports	0	0	0	12
AU 209 Report	773	825	1,441	972
AU 441 Report	0	280	628	503
Claims Review	4	0	0	1
OB Notification	105	77	71	67
OB Worksheet	16	34	0	0
Hysterectomy Worksheet	6	1	0	0
Infertility Worksheet	2	1	0	0
Total PacifiCare Vol.	1,847	2,408	6,096	2,191

Table 1: PacifiCare Applications Traffic Volume

In Table 1, note that three of the PacifiCare-specific messages--the OB worksheet, hysterectomy worksheet, and infertility worksheet--were not available until November 1997. Also, the much higher number of eligibility downloads, AU 209 reports, and AU 441 reports for the month of October 1997 was due to the overload and crash of the IMS Medacom network server at PacifiCare that resulted from an excessive backlog of messages that had been uploaded (sent) but not downloaded (received). All messages older than three months that had not been downloaded were deleted; these deletions were recorded in October as data transactions, the same as if they had been received by the subscribers.

The table shows that the most frequent PacifiCare-related use of the IMS Medacom system is for eligibility downloads. This is a list of PacifiCare members, the types and amounts of health services for which they are eligible, and copayment terms. This information is provided each workday from the PacifiCare corporate headquarters in Cypress, California, through an electronic link to the IMS central headquarters in Golden, Colorado. It is then uploaded to the IMS Medacom gateway server, located at PacifiCare's Regional Customer Service Center in San Antonio, and is downloaded from there to PacifiCare-sponsored subscribers.

Transmission of the AU 209 report is the second most frequent use of the network by PacifiCare. This report is also sent each morning from PacifiCare's corporate office to Golden, Colorado, and then to affiliated physician groups in San Antonio. It lists ongoing authorizations for individuals who are hospitalized, in a nursing facility, using home health care, or using durable medical equipment. It also records the number of days that these patients have been in the facility or using the service. The AU 441 and

AU 443 reports are monthly rollups of information from the AU 209 report. Their accuracy depends upon the daily correction of the information in the AU 209 by the physician groups, who send the changes to PacifiCare's San Antonio office, either by IMS Medacom or by facsimile machine.

The data in Table 2 is also derived from the monthly transaction reports of PacifiCare-sponsored subscribers. It shows the aggregate number of transactions received by these users, sorted by the applications that are offered by different network sponsors.

	<i>Dec 1997</i>	<i>Nov 1997</i>	<i>Oct 1997</i>	<i>Sep 1997</i>
PacifiCare-Sponsored Subscribers	468	466	462	452
Two-Way Subscribers	422	420	416	406
PacifiCare Msg. Volume	1,847	2,408	6,096	2,191
Baptist HS Msg. Volume	12,151	13,014	15,722	12,376
Humana Msg. Volume	6,193	6,801	6,481	6,392
Santa Rosa Msg. Volume	9,447	7,570	8,721	8,109
General Messages	785	917	736	444
Broadcast Messages	277	263	1,524	1,636
Other	330	174	489	375
Total Messages	31,030	31,147	39,769	31,523

Table 2: PacifiCare-Sponsored Subscriber Messages

The most common Baptist Health System applications used were radiology reports, patient discharge cumulative reports, and medical record reports. The most frequently used Humana applications were claims encounter reports, claims encounter responses, and eligibility inquiries and responses. The most frequently used Santa Rosa applications were medical record transactions, radiology reports, and admission censuses. "Other" messages included messages sent to IMS Medacom and to organizations that are

not sponsors, but which use the system and host certain applications, notably Meditech Lab System and Dictaphone.

Table 3 shows the total number of transactions, sorted by the sponsors of the applications, for the entire IMS Medacom San Antonio network. Some information for September 1997 was not available.

	<i>Dec 1997</i>	<i>Nov 1997</i>	<i>Oct 1997</i>	<i>Sep 1997</i>
Total Subscribers	2,071	2,018	1,953	1,933
Two-Way Subscribers	1,795	1,744	1,687	1,674
PacifiCare Msg. Volume	1,847	2,408	6,096	2,191
Baptist HS Msg. Volume	38,039	35,734	46,091	NA
Humana Msg. Volume	38,761	35,573	37,076	NA
Santa Rosa Msg. Volume	47,256	38,961	44,188	NA
General Messages	2,242	2,045	2,773	NA
Broadcast Messages	1,086	1,055	1,526	NA
Other	26,821	33,140	35,481	NA
Total Messages	156,052	148,916	173,231	147,656

Table 3: IMS Medacom San Antonio Traffic Volume

The most frequently used applications for each of the sponsors were the same for the total network as they were for PacifiCare-sponsored subscribers. Note, finally, that in all tables the number of subscribers listed is the number of physicians. Hence, a medical group with ten physicians would be counted as ten subscribers. A laboratory with no physicians would not be counted here as a subscriber. Retail pharmacy chains are not yet included in the IMS Medacom San Antonio network.

B. PacifiCare Transaction Reports.

One of the key methods that PacifiCare uses to communicate with providers and members of its health care plans is the Voice Response Unit or VRU. The VRU allows

inquiries to be made about an individual's benefit maximums, benefit usage, and eligibility status. It may also be used to request new identification cards. The VRU system is totally automated, receiving input from the caller's touch-tone telephone and providing the requested information through a voice synthesizer. Callers may request to be transferred to a live operator / customer service representative.

Of particular interest to this study is the number of requests for eligibility information, because these, unlike requests for other information, are made almost entirely by providers. PacifiCare delivers eligibility data to providers, as often as desired, by a variety of methods—disks, electronic mail, paper copies, and IMS Medacom downloads. Nevertheless, the VRU remains a popular and heavily used method for providers to get up-to-date eligibility information. In interviews, the office staff of providers says that they like its ease of use, not having to talk to an operator, and the fact that the VRU gives a confirmation number along with the information. Table IV shows use of the VRU for the months of June through September 1997, the most recent four months for which data was available.

Note that while the Voice Response Unit is located at the Regional Customer Service Center in San Antonio, the numbers in Table IV are for callers from all three of the Texas markets (Dallas, Houston, and San Antonio). The figures are divided between requests for information on commercial members (from health plans paid for by employers) and information on Secure Horizons (SH) members (from the Medicare risk program). Approximately half of all PacifiCare health plan members in Texas are in the San Antonio market (48 percent of commercial members and 49 percent of Secure Horizons members).

	<i>Sep 1997</i>	<i>Aug 1997</i>	<i>Jul 1997</i>	<i>Jun 1997</i>
Total Texas Membership	200,728	206,408	203,115	190,740
Commercial Membership	131,364	137,141	137,628	125,391
Secure Horizons Membership	69,331	69,267	65,487	65,349
Commercial Eligibility Checks	12,050	11,514	11,960	9,657
Percent Opt outs	2%	3%	3%	3%
Percent Transfers	6%	6%	6%	5%
Completed Eligibility Checks	10,767	10,177	10,671	8,632
SH Eligibility Checks	8,846	8,524	8,689	7,725
Percent Opt outs	2%	3%	3%	3%
Percent Transfers	6%	6%	6%	5%
Completed Eligibility Checks	8,107	7,746	7,895	7,045
Total Texas VRU Usage	25,613	24,578	25,555	21,895
Percent Opt out / Transfers	16%	17%	16%	17%
Net Texas Calls Handled by VRU	21,562	20,491	21,410	18,197

Table 4: Texas Use of PacifiCare's Voice Response Unit

In Table 4, the percentage of calls that opt out indicates calls that are placed to the unit but which are not completed to the point in which the VRU provides the requested information. The percentage of transfers indicates calls that are transferred at the caller's request to an operator / customer service representative. As is apparent from the figures in the table, health plan members (who call mostly for benefits information) are substantially more likely to opt out or request a transfer than are providers (who call principally for eligibility information).

Targeted Survey of Providers

As discussed in the section on methodology, I conducted a targeted survey of PacifiCare-affiliated providers who are subscribers to IMS Medacom by sending a copy of the questionnaire by facsimile machine after talking to the office manager or other office representative on the telephone. I called each of the 67 primary care practices and

65 specialist practices that are PacifiCare-sponsored subscribers. During the telephone conversation, I asked whether the office used IMS Medacom for PacifiCare functions. Many replied that they did not, or that they did not use the system at all (though they were subscribers). Of the 132 practices that I called, 124 answered this question, for a telephonic response rate of 94 percent. If I did not receive a written response from a practice within five working days, I made an additional phone call to them. I eventually received 34 surveys, 10 from primary care practices and 24 from specialist practices, for a written response rate of 26 percent. The 34 practices that responded represent 172 physicians. (I also sent surveys to the two PacifiCare-affiliated MSOs and received a response from one, bringing the total number of surveys received to 35.) The 19 practices that said during the telephone interview that they did use IMS Medacom for PacifiCare functions were more likely to respond to the written survey. 15 of these practices returned a survey, for a response rate of 79 percent. (Actually, the four remaining practices that had responded "yes" all have the same managed-care specialist who uses the system. That person gave a telephonic response for each practice but did not return their questionnaires.)

I compared the returned surveys to the IMS Medacom transaction reports for the month of December 1997. The transaction reports show, by provider, medical group, or independent physician association, the actual number and types of transactions sent and received from each workstation. Cross-checking the survey responses of a practice against the transaction report information for that practice provided a way to verify accuracy of the responses and to create a more complete picture of how the system is used. The combined results are shown at Appendix C.

Since I spoke with every PacifiCare-sponsored practice that is a subscriber, I was able to avoid the potential difficulties of the sample being either biased or too small to obtain statistically significant results—at least for the telephonic portion of the survey. I must accept that the written responses were from a self-selected group and may not be truly representative of the whole (Spatz, 1993). As explained below, however, I was able to check much of the data provided by the respondents to the written survey. Since it turned out that many respondents were unable to provide accurate assessments of their own use of IMS Medacom, I did not try to extrapolate their responses to the whole group. In the end, the most accurate representation of IMS Medacom use came from the transaction reports. A principal advantage of the transaction reports was that I was able to check the usage of all PacifiCare-sponsored subscribers, rather than relying upon a possibly biased sample.

My survey found that many medical groups who are IMS Medacom subscribers do not actually use the system, or they use it very little. When asked whether the practice uses IMS Medacom for PacifiCare functions, of the 132 medical practices, 19 said “yes,” 105 said “no,” and 8 were not sure. I cross-checked these responses against the IMS Medacom transaction report for December 1997. Of the 19 who had said on the phone that they used the system for PacifiCare functions, only 7 actually did. Additionally, two of the eight who were not sure actually did receive or send PacifiCare transactions in December. Of the 105 who said that they did not use the system for PacifiCare functions, 5 actually received or sent some PacifiCare transactions. These results are summarized in Table 5.

<i>Do you use IMS Medacom for PacifiCare functions?</i>	<i>Actually used PacifiCare transactions in Dec '97</i>	<i>Actually did not use Pac. transactions in Dec '97</i>
Yes 19	7	12
No 105	5	100
Not sure 8	2	6
Total 132	14	118

Table 5: Telephonic Responses vs. Transaction Report

The information provided on the written questionnaire was of varying accuracy. 82 percent of the respondents indicated that they used IMS Medacom to communicate with hospitals—the transaction reports showed that 73 percent actually did communicate with Baptist Health System or Santa Rosa hospitals in December 1997. 27 percent said that they used the system to receive PacifiCare eligibility information, but only 9 percent actually did. (PacifiCare eligibility lists are not even made available to specialist practices, yet some reported that they used the system for this purpose.) Just one provider reported receiving PacifiCare AU 209, AU 441, or AU 443 reports through the system, although three of the respondents actually received these reports.

The survey asked providers to indicate their overall level of satisfaction with IMS Medacom, on a scale of 1 – 5, with “1” being very dissatisfied, “3” being neutral, and “5” being very satisfied. The average of responses from the 10 primary care practices was 4.0. The average of responses from the 24 specialist practices was 3.64. The responses from all 35 returned surveys (30 answering this question) was 3.73.

Besides using the December 1997 transaction reports to cross-check the returned questionnaires, I also used the reports to profile the IMS Medacom usage of each of the 67 primary care practices, 65 specialist practices, and 2 MSOs that are PacifiCare-sponsored subscribers. I found that just 11 primary care practices, 3 specialist practices,

and both MSOs used PacifiCare functions on the network that month. The primary care practices received a total of 138 eligibility downloads and 111 AU 209, AU 441, or AU 443 reports through the system. The only PacifiCare applications used by the specialist practices were the various OB notifications and worksheets. A total of 131 were sent by the 3 specialist practices. Note that these figures are significantly below the total numbers of these transactions sent and received in December 1997, as shown in Table 1. The remainder of the transactions were sent by users other than providers, such as PacifiCare's San Antonio office, the IMS Medacom office, and the MSOs. The two MSOs together received 652 eligibility downloads, 233 AU 209, AU 441, or AU 443 reports, and 128 OB notifications and worksheets through IMS Medacom.

Other Survey Data

A. PacifiCare Provider Satisfaction Survey.

The Research and Analysis office of PacifiCare's corporate headquarters conducted a Provider Satisfaction Survey of the Southwest and West/Northwest Regions during the last three months of 1996. They conducted 844 telephone interviews, lasting about 20 minutes each. They spoke to primary care providers, administrators, and medical directors, at independent practice associations (IPAs) and medical groups doing business with PacifiCare.

The Southwest Region is serviced by PacifiCare of Texas and is composed of the markets of San Antonio, Dallas, Houston, Tulsa, and Oklahoma City. The West/Northwest Region also consists of five markets. The number of interviews in each of the Southwest Region markets ranged from 37 to 58, with 46 interviews being done in the San Antonio market. The number of interviews in each market was fairly small due

to the factor of provider willingness to participate in the survey and, in some cases, a small universe. Because of the small numbers, the survey used letter grades, as well as actual percentages, to interpret the data. Each letter grade represents an interval of one standard deviation from the average response to a particular question for all markets in both regions.

The survey consisted of twenty questions covering a range of issues including perception of PacifiCare, satisfaction with the level of reimbursement, quality of service, and effectiveness of communication. It is significant, for the purposes of this survey, that PacifiCare had barely begun to use IMS Medacom in San Antonio at the time of this survey. San Antonio remains the only PacifiCare market to use the system, so it is fair to assume that the survey represents the performance of PacifiCare without the IMS Medacom system.

The first question was "Overall, how satisfied are you?" 100 percent of the San Antonio responders answered that they were very satisfied or somewhat satisfied. To the question, "How well has PacifiCare lived up to its expectations?" 96 percent of the San Antonio responders answered "much better," "better," or "about the same." For each of these questions, San Antonio received a grade of "A," while the other nine surveyed markets received seven grades of "B" and two grades of "C" on each question.

Two questions dealt directly with communications. On the first, 96 percent of San Antonio responders either "strongly agreed," "agreed," or "neither agreed nor disagreed" that PacifiCare "effectively communicates with providers." On the second, 97 percent of San Antonio responders either "strongly agreed," "agreed," or "neither

agreed nor disagreed" that PacifiCare's communication compared to its biggest competitor. San Antonio was graded "A" for each of these questions.

One of the five questions on satisfaction with service showed that 100 percent of San Antonio responders either "strongly agreed," "agreed," or "neither agreed nor disagreed" that PacifiCare "responds to inquiries in a timely manner." On some questions, some markets received the lowest grade possible, "F." The lowest grade received by the San Antonio market on any question was "C." For every question except one, San Antonio received one of the highest grades of any of the ten markets. On a similar, but smaller 1995 survey of eight of the ten markets in the 1996 survey, San Antonio also received grades of "A" for overall satisfaction and meeting or exceeding expectations.

B. IMS Medacom Users Appreciation Conference Survey.

On November 11, 1997, IMS Medacom San Antonio held its annual User Appreciation Conference. The conference was held at Humana's San Antonio headquarters and lasted about two hours. All subscribers to the network were invited and a box lunch was served. About 100 persons attended and 66 of these completed survey forms. The four sponsors split the cost of the conference with IMS Medacom (about \$1,000) and each made a presentation. Many of those attending the conference were the office managers, secretaries, or nurses that actually used the IMS Medacom system in their physicians' offices, but some physicians attended as well. My subjective observation was that the group was mostly made up of two kinds of users: committed users who were comfortable with the system and new subscribers who wanted to learn more about it.

The survey asked whether the user wished to serve on a User Advisory Board for the network. Eleven respondents indicated that they would, including three physicians. In response to the question "Is your IMS Medacom system working well?" 61 responded "yes," two responded "no," and one responded "yes and no." 31 attendees indicated that a member of their office needed additional training.

Eight attendees made additional comments on their survey sheets. Three comments indicated a desire for additional training in the use of the system. Two requested help in getting other physicians to use the system. One complimented an IMS Medacom installer. One asked for a visit from a Humana representative. The remaining comment, from a surgical clinic was, "Our PacifiCare PCP gives us a reference number over the phone, but they fail to get it into the system. Claims are denied!"

C. IMS Medacom San Antonio Customer Satisfaction Survey.

In January 1998, IMS sent a customer satisfaction survey to every practice that subscribes to IMS Medacom in the San Antonio area. The survey was sent, and could be returned, over the IMS Medacom system. The practices were told that all offices responding would be entered into a drawing, with the winner receiving food for everyone in the office, with the type of food dependant on how soon the survey was returned. 41 responses were received, from offices having a total of 143 physicians. This is response rate of just under seven percent. In every case, the person answering the questionnaire held an administrative job, such as office manager or billing clerk, rather than a clinical position. (Interestingly, 36 of the 41 persons completing the survey were female.)

Some of the requested information was relevant to the IMS information systems specialists, such as the kind of computers and operating systems the respondents used.

17 of the 41 offices indicated that their computer on which IMS Medacom was installed shared a telephone line with other devices, such as a telephone or facsimile machine. 9 offices indicated that they had needed to buy some new equipment to install IMS Medacom, mostly modems.

The questionnaire asked for the title of the person who uses IMS Medacom to complete various tasks. Administrative, rather than clinical, personnel were reported as performing the tasks in most cases: verifying eligibility in all cases but two; submitting claims in all cases; requesting referrals in all cases but five; requesting/printing reports in all cases but two; and checking claims status in all cases. (Note that not all offices said that they used IMS Medacom for all these tasks.) In every case where clinical personnel were reported as performing a task, the person was a nurse or medical assistant. 9 practices reported that IMS Medacom was also installed in the physicians' offices, while 32 reported that it was not.

When asked to rate the features for each of the four sponsors, Humana features were rated as "excellent" by 18 respondents, "good" by 16, "fair" by 2, and "poor" by 1, with 4 not giving a rating. PacifiCare features were rated as "excellent" by 13 respondents, "good" by 15, "fair" by 3, and "poor" by 3, with 7 not giving a rating. Interestingly, only 8 of the 41 practices responding are affiliated with PacifiCare and would have access to PacifiCare features. I was unable to discover how many of the practices are affiliated with Humana.

Survey respondents were asked to indicate their level of agreement with 28 statements. Table 6 gives the summary of answers to some of these.

Statement	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	No Answer
IMS installation did not adversely affect the workflow of my practice	6	22	6	6	0	1
IMS software works to my satisfaction	7	29	0	4	0	1
Clinical results are received faster with IMS Medacom Network	8	19	9	3	1	1
The Network has reduced phone calls to our sponsors	5	25	6	3	1	1
Our patients receive better care as a result of the Network	2	19	15	4	0	1
Would like to communicate with pharmacies	7	23	5	3	3	0
Would like to communicate with insurance companies	22	17	2	0	0	0
Would like to receive drug history information for patients	5	24	11	1	0	0

Table 6: Responses to IMS Customer Satisfaction Survey

Analysis of PacifiCare Employee Time and Cost Savings

As of January 1998, personnel at PacifiCare did not heavily use the IMS Medacom system. There are several reasons for this. First, since San Antonio is the only PacifiCare market that is using IMS Medacom at all, and that only recently, well-tried methods already exist for communicating with providers. Second, many of the San Antonio-area providers who do business with PacifiCare are not subscribers to IMS Medacom or do not use it regularly. There must still be ways to communicate with these providers. Third, with providers assuming an increasing portion of capitated risk and with it more responsibility for utilization management, there is less need for communication between PacifiCare and its affiliated providers. Fourth, many PacifiCare managers and employees are not very familiar with the IMS Medacom system and

therefore do not use it to the fullest extent practical. Indeed, the PacifiCare general manager who was most knowledgeable about the system, and who was instrumental in the decision to begin sponsorship, has since departed the company to become the president of a medical services organization. Since his departure, interest in using the system has declined.

It is nevertheless worthwhile to calculate whether there would be any time or cost savings to PacifiCare if it used the IMS Medacom to the greatest extent feasible. Tangible savings might be realized if the use of the system saved time spent on the facsimile machine or the telephone, time spent mailing documents or transcribing information, and money spent on envelopes and postage.

Analysts at PacifiCare use a figure of \$10.00 per hour as the average wage of clerical workers. The cost of benefits (Social Security payments, unemployment insurance, worker's compensation, health benefits, vacation time, etc.) must also be considered in any calculation of labor cost. One study found that the cost of these benefits averaged 37.7 percent of organizational payroll (Mathis & Jackson, 1988). Another survey found that benefits averaged 39 percent of total payroll (Fossum, 1995). Using the figure of 39 percent, the benefits for a wage of \$10.00 per hour would be \$6.40 per hour [benefits = .39(wage + benefits)]. I therefore used a figure of \$16.40 for all labor costs. The product of each calculation below has been rounded off, if necessary, to the next highest dollar.

A. Customer Concerns and Complaint Reports.

1. Each workday, one person spends about three hours sending, receiving, sorting, and distributing these reports via facsimile machine and interoffice messenger

from about 29 locations. This form is available as a PacifiCare application on IMS Medacom. Few if any of these reports are currently transmitted on IMS Medacom; if all were, the quarterly labor savings would be approximately \$2,952. [20 days/month x 3 months x 3 hours/day x \$16.40/hour = \$2,952.]

2. Each medical group that is the subject of a Customer Concerns and Complaint Report responds with information that is used to help resolve the case. A daily log is maintained at PacifiCare listing all new complaints or concerns received and the status of all open cases. The medical group's response is added to the log. Much transcription time would be saved if all responses were received via IMS Medacom, from where they could easily be copied into the log. Currently, however, three persons spend about two hours a day each in transcribing telephone conversations or retyping written responses. If one half of this time could be eliminated, the quarterly labor cost savings would be approximately \$2,952. [20 days/month x 3 months x 1 hour /day x 3 employees x \$16.40/hour = \$2,952.]

B. AU 209 Reports. Three people spend about 15 minutes each sending this report to providers each workday. This form is now available on IMS Medacom and is sent out every workday to each provider automatically (via download from PacifiCare corporate headquarters in Cypress, California, through IMS headquarters in Golden, Colorado, and through the IMS Medacom Gateway at the PacifiCare San Antonio office). Some providers receive it this way, while others continue to use the facsimile machine. The quarterly labor cost of using the facsimile machine for these reports is approximately \$738. [20 days/month x 3 months x 15 minutes/day x 3 employees x \$16.40/hour = \$738.]

C. AU 443 reports. This monthly rollup of some of the information in the AU 209 report is mailed to providers. Three persons spend about 15 minutes each preparing the mail. This form is also available on IMS Medacom and is automatically sent out to each provider. If copies did not have to be mailed, the quarterly labor savings would be \$37. [1 day/month x 3 months x 15 minutes/day x 3 employees x \$16.40/hour = \$37.] The quarterly savings in postage and envelopes would be \$57. [1 mailing/month x 3 months x 29 recipients x (\$0.55 postage + \$0.10 envelope) = \$57.]

D. No Authorization Log. Once a week, PacifiCare generates a listing of the claims it has received that do not have an authorization number listed in the authorization system. This listing is then sent by facsimile machine to the medical groups for them to review and correct. It takes one person about twenty minutes to send and receive the reports on the facsimile machine each time it is generated. The quarterly labor cost for this is approximately \$142. [13 weeks/quarter x 20 minutes x \$16.40/hour = \$71.] There is currently no script available on IMS Medacom to perform this function, but one could be added if PacifiCare were willing to pay for the programming.

E. OB Notifications. All obstetric care in the San Antonio area for PacifiCare's commercial accounts (the health coverage sold to employers) is provided by an OB/GYN IPA that contracts with Quantum Southwest Medical Management, LLC, a management service organization that is a PacifiCare "Preferred Partner," for its administrative work. Quantum, which also provides services to eleven medical groups affiliated with PacifiCare, is a leading user and proponent of the IMS Medacom system in the San Antonio area. Prior to PacifiCare's contract with IMS Medacom, OB notifications of new pregnancies were sent to PacifiCare by mail or facsimile machine (about equally

divided between the two). Now, almost all OB notifications are sent via IMS Medacom. In the last quarter of 1997, PacifiCare received 253 OB notifications. Starting in November 1997, an OB worksheet, hysterectomy worksheet, and infertility worksheet were added to IMS Medacom, and have now largely replaced the paper versions of these forms.

The OB notifications and worksheets are sent to both Quantum and PacifiCare. Quantum then performs most of the administrative work, claims processing, and utilization management associated with the cases. For these purposes, the IMS Medacom form saves a good deal of retyping, making for easy entry of the information into their computer records. I have not attempted to estimate the time or cost savings by Quantum, the providers, or anyone other than personnel at PacifiCare. At PacifiCare, clinical information associates (CIAs) receive the reports of new pregnancies and enter it into PacifiCare's database. The customer service center uses this information to ensure that the expectant mothers have information about potential physicians (in family practice or pediatrics) for their newborns and that eligibility information is updated at the appropriate time. I estimate that CIAs now save about three minutes per OB notification by receiving the information via IMS Medacom rather than by mail or facsimile machine. If the last quarter of 1997 is representative of the number of OB notifications received throughout the year, the quarterly labor cost savings is approximately \$208. [253 notifications x 3 minutes x \$16.40/hour = \$208.]

In early 1997, an initial in-house study estimated that the potential cost savings from using IMS Medacom would be \$9,767 per quarter (Kerchief, 1997). When I reevaluated those findings, I found that many of the processes described had been

reduced in frequency or eliminated altogether. The calculations above are therefore based on a somewhat different set of functions and revised estimates of the amount of time required for each function, as well as a different (higher) estimate of the cost of labor.

The potential savings to PacifiCare, if it could move the identified functions entirely to IMS Medacom, as described above, are summarized in Table 7.

<i>Function</i>	<i>Potential Cost Savings</i>
A. 1. Send Customer Concerns & Complaint Forms	\$2,952
2. Log Responses to Customer Complaints	2,952
B. Send AU 209 Reports by Facsimile Machine	738
C. Send AU 443 by Mail	94
D. Send No Authorization Log by Facsimile Machine	71
E. Receive OB Notifications	208
Total Potential Savings	\$7,015

Table 7: Potential Cost Savings from Using IMS Medacom (Quarterly)

The sponsorship agreement that PacifiCare and IMS entered into in March 1996 was for a five-year period that began upon PacifiCare's initiation into the system, in October 1996. PacifiCare paid a one-time network initiation fee of \$56,250 and continues to pay an annual network fee that started at \$187,500 per year (\$46,875 quarterly) and which is increased by the change in the Consumer Price Index each year. (All of these fees, agreed to after extensive negotiation, represent a 37.5 percent reduction from IMS's standard fees for managed care organizations of PacifiCare's size.)

PacifiCare has the option to extend the contract for one, three, or five years under the same terms. The contract provides that PacifiCare may terminate the service on its third anniversary (October 1999) "if it is determined that there are bona fide, verifiable

conditions that have substantially detracted from the value of the Network to PacifiCare and its subscribers . . .”

Discussion

Provider Use of IMS Medacom

Table 1 shows that PacifiCare-sponsored providers use IMS Medacom for about 2,000 PacifiCare related transactions per month. About half of these are receipts of eligibility data. OB/GYN providers have recently begun to use several forms and worksheets specific to their practice. Table 2 shows that PacifiCare-sponsored providers use IMS Medacom for about 29,000 other transactions per month, mostly using scripted message formats from Baptist Health Systems (about 13,000), Santa Rosa (about 8,000), and Humana (about 6,000). Table 3 shows that the approximately 2,000 San Antonio providers who subscribe to IMS Medacom send a total of about 150,000 per month: about 2,000 PacifiCare messages (1.3 %), 45,000 Santa Rosa messages (30 %), 38,000 Baptist Health Systems messages (25 %), and 37,000 Humana messages (24 %).

My targeted survey found that many medical groups who are IMS Medacom subscribers do not actually use the system, or use it very little. There seemed to be several reasons for this. First, there is the inertial difficulty in getting the majority of providers to adapt to and use anything new. While a certain small percentage of physicians (or more likely, administrators) can be expected to be “early adopters,” willing and eager to try out the latest technology of any kind, most providers will be slower to change their established methods. A certain percentage can be expected to cling to older methods for a very long time, because of conviction, a lack of incentive to change, or fear that change will be too difficult. Well-known examples of this pattern of gradual

acceptance of new technology come from the consumer electronics industry. A core of early adopters used videocassette recorders, compact disc players, and telephone answering machines for many years before these items gained mainstream acceptance and use. However, there were also early adopters of such technologies as Betamax video and laser disc players, which never did achieve general acceptance.

The marketing efforts of IMS seem to have taken IMS Medacom beyond the Betamax stage, at least in San Antonio. About half the physicians in the San Antonio area have become subscribers with more joining at a rate of 40 – 50 per month. Because these subscriptions are offered free of charge, however, it is hard to measure the degree of commitment that subscribers have to the system. The targeted survey and the analysis of transaction receiver and sender reports made it clear that many subscribers do not use the system regularly and that there is often a significant variance of usage levels even within the same practice. Further, where the system is in use, it is mostly being used by administrative staff rather than by physicians.

A second reason that many practices are not using the system is that they find other methods of communication to be more convenient. Many of the network users who responded to the targeted survey indicated that it took too long to get information using IMS Medacom. They said that they preferred to use the telephone or facsimile machine. Even subscribers who regularly use IMS Medacom are likely to rely on PacifiCare's Voice Response Unit for eligibility confirmation, as indicated both by their responses on the survey and the heavy use of the Voice Response Unit by providers.

The transaction reports show that only 11 of the 67 primary care practices who are PacifiCare-sponsored subscribers to IMS Medacom actually send or receive any

PacifiCare transactions. Further, the fact that the practice is receiving a PacifiCare report via the system does not necessarily mean that it is "using" the report. The responses to the targeted survey by many providers indicated that many do not know what to do with the reports that they receive. Messages that are received and deleted by the user, or even deleted without having been read, are reported on the transaction reports the same as if they were actually printed out and used.

Specialist practices were even less likely to use PacifiCare transactions. Only 3 of the 65 PacifiCare-sponsored subscribers used the system. All of these uses were for sending OB/GYN notifications or worksheets, mostly to their servicing MSO. These scripts seem to be genuinely useful to the small number of OB/GYN practices that PacifiCare contracts with. The worksheet scripts have been available on the system for less than three months, however, and is hard to believe that it would be much of a hardship to these practices if they had to revert to their former modes of communication if these forms were no longer available.

Still, message traffic of 150,000 messages per month indicates that many practices are using the system regularly. The vast majority of messages appear to be for clinical or hospital purposes. That is, providers are using IMS Medacom to view patient records, to send and receive radiology and laboratory results, to schedule hospital appointments, and to make referrals to specialists. These are exactly the items that consistently appear in the literature as the most prevalent and valuable uses of community health information networks. This is why hospital groups are usually the primary sponsors of these networks, including the many IMS Medacom networks around the country. In San

Antonio, IMS Medacom users are most likely to use message formats designed for the Baptist and Santa Rosa hospital systems.

Other HMO use of IMS Medacom

The biggest exception to the general rule that hospitals are the organizations most likely to sponsor community health information networks is Humana. Humana is a national sponsor of IMS Medacom and a local sponsor of the San Antonio network. In San Antonio, Humana has approximately 19% of the HMO market, second only to PacifiCare's 23% (Turner, 1998). Why then, does Humana have about 18 times as much traffic on IMS Medacom as does PacifiCare?

Practices appear to use Humana-sponsored applications for both clinical and administrative purposes. Clinical functions include referrals by primary care providers to specialists and receipt of member data files. Heavily used administrative functions are checks of eligibility for benefits and the submission of encounter reports/claims. These four functions account for over 90% of Humana's IMS Medacom traffic.

Two differences between Humana and PacifiCare account for the great variance in their use of IMS Medacom, and these differences are key to the purpose of this study, to ascertain whether the benefits that PacifiCare derives from its sponsorship role are worth the price that it pays. The first difference is that Humana manages the care of its members much more closely than PacifiCare does. While PacifiCare has largely shifted capitated risk and utilization management to the primary care medical groups, Humana has remained in the traditional HMO role. Humana actively manages healthcare, approves treatments, and pays providers for their services. Consequently, it has a much greater need for frequent and rapid communication with providers, such as the encounter

reports/claims that make up so much of its IMS Medacom traffic. The greater amount of control that Humana asserts over the medical care of its members is reflected in the frequent use of their IMS Medacom script for referrals between primary care providers and specialists. Humana needs to see and, often, needs to approve, or "precertify," these referrals. PacifiCare has a similar IMS Medacom physician referral script, but it is barely used. Its providers use the hospital-supplied IMS Medacom referral scripts instead, because PacifiCare does not control this aspect of their practice.

The second difference between the two HMOs is that Humana, as a national sponsor of IMS Medacom, has adapted corporate-wide procedures to take advantage of the capabilities of the system. Its communication processes are largely designed with IMS Medacom in mind. PacifiCare, on the other hand, only uses IMS Medacom in the San Antonio market. Its corporate-wide methods of communication were created without regard to the IMS Medacom network. The corporate headquarters in Cypress, California, has a sizable staff of information systems specialists who have developed, and who maintain, a highly efficient and capable set of communication tools. PacifiCare can do its job without IMS Medacom.

An example of these different approaches is the crucial matter of supplying eligibility information to providers. To check the eligibility of a Humana-covered patient, a provider sends an eligibility check message over IMS Medacom to Humana's San Antonio office. An automated response unit attached to the Humana database will send back a reply. PacifiCare did not choose to include this capability when it contracted with IMS. The company had two principle objections to this procedure. First, for security reasons, it did not want an outside vendor (IMS) directly attaching any device to

its corporate host computer system. Second, PacifiCare's computer host is a "home-grown" system. The modifications to allow it to handle electronic data interchange transactions would have to be performed by the corporate information systems department, in California. It is hard to justify this expense for use in just one, or a few, markets, especially when the company already has other means of performing eligibility checks. Physicians have expressed a high rate of satisfaction with PacifiCare's system of using regularly updated eligibility lists (delivered by the means most convenient to the practice) and the Voice Response Unit.

PacifiCare use of IMS Medacom

PacifiCare uses some IMS Medacom applications, but its usage has not significantly increased in the last year. There is little incentive to expand use of the system. IMS Medacom is only an additional way of accomplishing tasks, and is unlikely to ever be the company's principal way of sending or receiving information. Reliable, efficient methods of sending and receiving information are already well established at PacifiCare. These include the Voice Response Unit, customer service associates who provide information over the telephone, facsimile machines, courier delivered tapes and disks, and electronic file transfer through Internet-based electronic mail. The Provider Satisfaction Surveys conducted by PacifiCare in 1995 and 1996 (largely before the company began using IMS Medacom) found that providers in the San Antonio area gave very high marks to PacifiCare for effective communication.

The potential cost savings that PacifiCare could achieve through the use of IMS Medacom have been calculated, in different amounts, in this paper and in previous studies. In every case, the actual achievement of these savings is highly speculative and,

indeed, unlikely. To realize the savings, it would be necessary to entirely eliminate the current methods of sending various messages and replace them with IMS Medacom transmissions. For the many reasons already cited, it is unrealistic to believe that this will be possible anytime in the foreseeable future. Further, even if the other communication methods could be replaced, the savings to PacifiCare in personnel time, increased efficiency, decreased postage expense, etc. would still be far short of the annual cost of the sponsorship fee.

At PacifiCare's San Antonio offices, there is generally little knowledge about the IMS Medacom system and even less interest in expanding its use. Because of turnover and reorganization, many of the employees who were trained on the system when it was initiated are no longer in the same positions. Supervisors do not see the need for or advantage of the system and are therefore reluctant to spend the time and effort to train new employees on how to use it. The result is that the system is not used even to the extent that it could be. At worst, the system has become a distracter from the orderly accomplishment of the business at hand. It is one more thing to worry about, without being much actual use.

Finally, I found no evidence that PacifiCare's sponsorship of IMS Medacom has enhanced its professional reputation in the San Antonio area or increased its ability to recruit physicians to its provider network. Providers are more likely to desire affiliation with PacifiCare because it has the largest HMO membership in the area or because it minimally interferes with physicians' methods of practice. Providers who are interested in using IMS Medacom can easily obtain sponsorship through Baptist Health Systems or Santa Rosa, the hospital organizations that are the primary users of the system. I found

no evidence that sponsorship has harmed PacifiCare's reputation, but there is the potential of this happening if the company fails to effectively utilize a system that it publicly sponsors and endorses.

Conclusion and Recommendation

PacifiCare derives little or no value from its sponsorship of IMS Medacom in the San Antonio area. There is no real potential for significant cost savings at PacifiCare through the use of the IMS Medacom system. IMS Medacom does not replace existing methods of communication and there is no real chance that it ever will. Indeed, the existing communications systems function very effectively and achieve high levels of provider satisfaction.

Providers that use the IMS Medacom system are much more likely to use applications furnished by one of the other area sponsors than they are to use a PacifiCare application. Their affiliation with those other sponsors would make them eligible for free IMS Medacom service even if PacifiCare were not a sponsor. There is no evidence that sponsorship of the San Antonio IMS Medacom network enhances the professional reputation of PacifiCare or improves its ability to recruit physicians to its provider network.

PacifiCare should terminate its sponsorship of the San Antonio IMS Medacom network. It should do this as inexpensively as possible, that is, by the method that will result in least additional payment to IMS. If it cannot negotiate an earlier termination of sponsorship, it should attempt to exercise the contractual provision allowing termination after three years. The change in the relationship between PacifiCare and the medical groups that now provide capitated care to its members has largely eliminated the potential

for the system to ever return any significant benefits to PacifiCare. This should provide a basis for early termination, as provided for in the sponsorship agreement.

PacifiCare's termination of sponsorship should pose few difficulties for itself or its affiliated providers. The only PacifiCare unique functions that might be missed by providers are the OB/GYN forms that a very small number of subscribers use. These forms are such a recent innovation that reverting to the former reporting practice should pose little hardship on these providers. PacifiCare already has alternative (and more usually used) ways of doing every other function for which it currently uses IMS Medacom. Transition from the system will therefore amount to little more than giving advanced notice to the subscribers that PacifiCare sponsors, removing the software from the company's personal computers, and returning the gateway server to IMS Medacom.

Appendix A

Glossary

AU 209, AU 441, and AU 443 reports – PacifiCare forms used to transmit information between the corporate headquarters in California, regional and market PacifiCare offices, and providers. The AU 209 lists ongoing authorizations for individuals who are hospitalized, in a nursing facility, using home health care, or using durable medical equipment and records the number of days that these patients have been in the facility or using the service. The AU 441 and AU 443 reports are monthly rollups of information from the AU 209 report.

Capitation – A financial arrangement by which the money received is based upon membership or the number of individuals cared for, not upon the actual services provided.

CHIN – Community health information network. A fully evolved data network that differs from enterprise and IDS networks in that it is owned by an independent entity and is available to provide health information to all organizations in the region. A developed CHIN allows for the costs of information switching, storage, and processing to be borne by a number of organizations.

CIA - Clinical information associate.

EDI – Electronic data interchange. The direct computer-to-computer exchange, between organizations, of standard business transaction documents.

E-mail – Internet-transmitted electronic mail.

General messaging – A function of IMS Medacom for the transmission of unformatted messages, similar to E-mail messages transmitted over the Internet.

HMO – Health maintenance organization.

IDS – Integrated delivery system. An IDS computer network facilitates information management between the affiliated and contracted parties of an organization or health care network and will normally include a data repository as an additional feature.

IMS – Integrated Medical Systems, Inc.

IMS Medacom – The community health information network service operated by Integrated Medical Systems (IMS). IMS operates separate networks in 56 geographic areas in the United States.

IPA – Independent practice association. An organization that contracts with a managed care plan to provide services at a capitated rate, and which contracts with providers to deliver the services on either a capitated or fee-for-services basis.

MDVS – Medical Device Vigilance System. A European-wide program to monitor the occurrence of medical device failure and to aid in the investigation of such incidents by both manufacturers and regulatory bodies.

MEDEUR – A message standard used in Western Europe for integrated patient data exchange between computer-based recordkeeping systems. MEDEUR structures physician, patient, and hospital information, and the medical data needed for the shared care of a patient by different physicians. It can be used for the transmission of a complete medical record or sections of one.

MSO – Management service organization. A form of integrated health delivery system that provides management services to medical groups or individual providers, to include, in many cases, contracting with managed care organizations.

PBM – Pharmacy benefit manager.

PCP – Primary care provider.

Preferred provider organization – A health care plan that contracts with a closed panel of individual providers for services at a discount. Also called a PPO, it can be risk bearing or non-risk bearing.

Script – A function of IMS Medacom that provides a standard format for a particular type of message, with specified data fields for the entry of data. Essentially, an electronic form.

Secure Horizons – The HMO health plan offered by PacifiCare to Medicare-eligible individuals.

Utilization management – The process of centrally controlling the type and amount of health care services provided to patients in order to achieve the best possible outcomes at the lowest feasible cost.

VAN – Value-added network. A private, multipath, data-only, third-party-managed computer network used by multiple organizations on a subscriber basis.

VRU – Voice Response Unit, an automated telephone-based system used by PacifiCare to provide certain kinds of information to members and providers.

Survey of PacifiCare Providers On Use of IMS MEDACOM

Practice Name: _____

Person Completing Questionnaire: _____

Practice Phone #: (____) ____ - ____

Practice Fax #: (____) ____ - ____

Number of Physicians in Your Practice: _____

1. Are the physicians in the practice primary care providers (PCPs) or specialists?

Check one: _____ PCP(s) _____ Specialist(s)

2. How long has your practice been using the capabilities of the IMS MEDACOM Network?
(Check one)

_____ < 6 months _____ 1 year _____ 2 - 3 years
 _____ 4 years _____ 5 years

3. Are you presently using general messaging on IMS MEDACOM to communicate with:

Other providers? _____ Yes _____ No

Medical groups? _____ Yes _____ No

Hospitals? _____ Yes _____ No

Others? Specify _____

If no, why not? _____

4. Do the physicians in the practice have medical privileges with any of the Baptist or Santa Rosa hospitals? _____ Yes _____ No

If yes, are you presently receiving hospital reports automatically over the IMS MEDACOM Network? _____ Yes _____ No

5. Who presently uses the IMS MEDACOM Network in your practice?

Check as many as apply.

_____ Receptionist/Scheduler

_____ Physician(s)

_____ Billing Specialist

_____ Administrator

_____ Referral Coordinator

_____ Office Manager

_____ Medical Records Specialist

_____ Nurse(s)

_____ Other: Specify _____

6. Are you using any of the following PacifiCare features available through the IMS MEDACOM Network? (Check all those that apply)

_____ Verifying patient eligibility

_____ Submitting OB/GYN Worksheets

_____ Authorizing patient referrals

_____ Submitting Hysterectomy Worksheets

_____ Requesting patient referrals

_____ Submitting Infertility Worksheets

_____ Checking on claims status

_____ Submitting OB Notifications

_____ Receiving AU 209/441 reports

_____ Making customer inquiries

_____ Reviewing drug formulary

_____ Making benefits inquiries

_____ Receiving provider announcements from PacifiCare

_____ Communicating with Provider Relations

_____ Sending notifications of patient births and deaths

_____ Updating credentialing info

7. If you are not using the IMS MEDACOM Network for any of the above-mentioned transactions, then what other means are you using? Please complete all of those that apply.

_____ Telephone Call to PacifiCare Voice Response Unit

Estimated # of calls per week: _____ calls

Estimated time on hold per call: _____ minutes

_____ Telephone Call to PacifiCare Claims Department

Estimated # of inquiries per week: _____ inquiries

Estimated time on hold per call: _____ minutes

_____ Telephone Call to other PacifiCare Departments

Estimated # of calls per week: _____ calls

Estimated time on hold per call: _____ minutes

_____ Fax Transmission to provider or PacifiCare

Estimated # of faxes per week: _____ faxes

Estimated time to transmit each transaction: _____ minutes

_____ Mailing to provider or PacifiCare

Estimated # of mail pieces per week: _____ pieces

Average turnaround time for action or response per transaction: _____ days

8. Please elaborate on any other reasons for not using the IMS MEDACOM Network.

9. Please indicate your overall level of satisfaction with IMS MEDACOM. (Circle one)

1	2	3	4	5
(Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied)

Thank you for completing this questionnaire! Your input is very much appreciated.

PLEASE FAX COMPLETED QUESTIONNAIRE TO VIVIAN HUTSON, PACIFICARE NETWORK COORDINATOR AT (210) 979-2443. PLEASE RESPOND BY JAN 15.

IF YOU HAVE ANY QUESTIONS REGARDING THE QUESTIONNAIRE, PLEASE CONTACT VIVIAN AT (210) 979-2304.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Use PAC Functions on IMS Medacom?	PCPs or Specialists?	# of Physicians	# of Work Stations	Use IMS Medacom to Comm. w/ Hospitals?	# of Baptist or Santa Rosa Transactions	Use IMS Medacom to Verify PAC Eligibility?	# of PAC Eligibility Downloads	Receive PAC AU 209/441/443s?	# of AU 209/441/443s Received	Use OB Notifications or Worksheets?	# of OB Notifications and/or Worksheets	Weekly Calls to Voice Response Unit	Weekly Faxes to PAC or Providers	Overall Satisfaction w/ IMS Medacom (1 - 5)
Medical Group, Independent Physician Association, or Provider															
HTMG-L	Yes	PCP	2	3	Yes	151	Yes	13	No	5	No	0	50	20	4
NESE	Yes	Spc	3	3	Yes	131	Yes	0	No	0	No	0		12	5
AF	No	PCP	1	1	Yes	0	No	0	No	0	No	0			4
USA	No	Spc	14	15		583		0		0		0			
CWHC	No	Spc		5		343		0		0		0			
CCC	No	Spc		5		1165		0		0		0			
HTMGSW		PCP		3		135		26		15		0			
HTMGPV		PCP		12		642		13		15		0			
SAECDT	No	Spc		2		35		0		0		0			
SAOG	Yes	Spc	8	9	Yes	527	Yes	0	No	0	No	0	130	40	3
JDK	No	PCP		2		1		0		0		0			
ESAPA	No	Spc	5	6	Yes	722	No	0	No	0	No	0	15		3
HC	No	Spc	1	1		4		0		0		0			
RNS	No	Spc		1		1		0		0		0			
HK	No	Spc		1		0		0		0		0			
SACW	No	PCP		2		0		13		0		0			
SACI	Yes	PCP	2	23	Yes	553	No	0	No	0	No	0	50		3
CCSA	No	Spc	15	16	Yes	509	No	0	No	0	No	0	30	50	4
STPMRG	No	Spc		5		77		0		0		0			
SBOBG	No	Spc		3		10		0		0		0			
SACB	No	PCP		1		221		0		0		0			
IWH	Yes	Spc	11	6	Yes	46	Yes	0	No	0	Yes	87			4
SAC2	No	PCP		1		217		0		0		0			
HRMGEH		PCP		1		0		1		0		0			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Use PAC functions on IMS Medacom?	PCPs or Specialists?	# of Physicians	# of Work Stations	Use IMS Medacom to Comm. w/ Hospitals?	# of Baptist or Santa Rosa Transactions	Use IMS Medacom to verify PAC Eligibility?	# of PAC Eligibility Downloads	Receive PAC AU 209/441/443s?	# of AU 209/441/443s Received	Use OB Notifications or Worksheets?	# of OB Notifications and/or Worksheets	Weekly Calls to Voice Response Unit	Weekly Faxes to PAC or Providers	Overall Satisfaction w/ IMS Medacom (1 - 5)
Medical Group, Independent Physician Association, or Provider															
HTMGB	No	PCP		2		124		5		0		0			
HEM	No	PCP		1		129		0		0		0			
HVIT	Yes	Spc	13	15	Yes	892	No	0	No	0	No	0			4
FMM	No	Spc		1		23		0		0		0			
ADTC	No	Spc		8		74		0		0		0			
HC	Yes	PCP	1	1	Yes	1	Yes	0	No	0	No	0			4
HTMGASS		PCP		3		95		0		8		0			
HTMGSAI	No	PCP		1		0		0		0		0			
TRG	No	Spc	3	4	Yes	264	No	0	No	0	No	0			5
MOBG				2		0		0		0		36			
CMM	No	Spc		1		0		0		0		0			
SAIM	Yes	Spc	8	5	Yes	42	No	0	No	0	No	0			4
IWHD				4		135		0		0		8			
IWHGMC	No	Spc		1		41		0		0		0			
IWHNE	No	Spc		1		0		0		0		0			
IWHNEB	Yes	Spc	2	3	Yes	182	Yes	0	No	0	No	0	30		4
FMC1	No	PCP		15		640		28		54		0			
MPHC	No	PCP		1		5		0		0		0			
SU	No	Spc		4		0		0		0		0			
ROBG	Yes	Spc	5	2	Yes	3	Yes	0	No	0	No	0			4
IA	No	Spc	21	13	Yes	239	No	0	No	0	No	0	50		4
MSXR				14		285		0		0		0			
FB	No	PCP		1		0		0		0		0			
CWK	No	PCP		1		0		0		0		0			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Use PAC functions on IMS Medacom?	PCPs or Specialists?	# of Physicians	# of Work Stations	Use IMS Medacom to Comm. w/ Hospitals?	# of Baptist or Santa Rosa Transactions	Use IMS Medacom to verify PAC Eligibility?	# of PAC Eligibility Downloads	Receive PAC AU 209/441/443s?	# of AU 209/441/443s Received	Use OB Notifications or Worksheets?	# of OB Notifications and/or Worksheets	Weekly Calls to Voice Response Unit	Weekly Faxes to PAC or Providers	Overall Satisfaction w/ IMS Medacom (1 - 5)
CHM	No	PCP		1		2		0		0		0			
FWM	No	PCP		1		7		0		0		0			
CPMG				1		0		0		0		0			
CPHC	Yes	PCP	2	3	Yes	67	No	26	Yes	14	No	0	30		5
PMG	Yes	PCP	3	1	Yes	0	Yes	0	No	0	No	0			3
BHMG	No	PCP		4		45		0		0		0			
FMCH	No	PCP		2		161		0		0		0			
NHHC	No	PCP	4	1	No	0	No	0	No	0	No	0	30	5	
EOG	No	PCP	1	1	No	12	No	0	No	0	No	0			
MRJ	No	PCP		1		1		0		0		0			
HRR	No	PCP		1		0		0		0		0			
FBJ	No	PCP	1	1		11		0		0		0			
AJW	No	SpC	1	1	Yes	58	No	0	No	0	No	0	2		4
KFPA (2 sites)	No	PCP		5		1		13		0		0			
CU	No	SpC		2		278		0		0		0			
STOBGA	No	SpC		3		111		0		0		0			
THG	No	SpC		1		85		0		0		0			
SBA	No	SpC		1		36		0		0		0			
RM	No	SpC		1		22		0		0		0			
PAS	No	SpC		2		642		0		0		0			
STCC	No	SpC		7		32		0		0		0			
JRC	No	SpC	1	1	Yes	58	No	0	No	0	No	0	4		4
DH	No	SpC		1		62		0		0		0			
LHC	No	PCP		1		60		0		0		0			

[illegible]

[illegible]

Notes

1. Name of the practice (medical group, independent physician group, or provider). Here abbreviated to preserve confidentiality.
2. Response to telephonic inquiry: "Do you use IMS Medacom for PacifiCare functions?" (Many responded that they did not use IMS Medacom at all.) If they answered that they did not use IMS Medacom for PacifiCare transactions (or at all), they were asked if they wished to complete a survey. No survey was sent if the office did not desire to receive one. ("Do not use" answers were later verified by checking transactions reports.)
3. From the survey. "Are the physicians in the practice primary care providers (PCPs) or specialists?"
4. From the survey. "Number of physicians in your practice."
5. From transaction reports. The number of computers or work stations in the practice that have IMS Medacom installed.
6. From the survey. "Are you presently using general messaging on IMS Medacom to communicate with hospitals?" or "Are you receiving hospital reports automatically over the IMS Medacom Network?"
7. From transaction reports. The number of Baptist Health Systems or Santa Rosa (the two hospital groups in the area using IMS Medacom) transactions sent or received from the practice in December 1997.
8. From the survey. Whether the practice uses the PacifiCare feature of IMS Medacom to verify patient eligibility.
9. From transaction reports. The number of PacifiCare eligibility list downloads received by the practice in December 1997.
10. From the survey. Whether the practice uses the PacifiCare feature of IMS Medacom to receive AU 209s, AU 441s, or AU 443s.
11. From transaction reports. The number of PacifiCare AU 209s, AU 441s, or AU 443s received by the practice in December 1997.
12. From the survey. Whether the practice uses the PacifiCare feature of IMS Medacom to send OB notifications, OB/GYN worksheets, hysterectomy worksheets, or infertility worksheets.

13. From transaction reports. The number of PacifiCare OB notifications, OB/GYN worksheets, hysterectomy worksheets, or infertility worksheets sent by the practice in December 1997.

14. From the survey (if answered). Estimated number of calls to the PacifiCare Voice Response Unit per week.

15. From the survey (if answered). Estimated number of facsimile transmissions to PacifiCare or to other providers per week.

16. From the survey. Overall level of satisfaction with IMS Medacom: 1 = Very Dissatisfied; 2 = Dissatisfied; 3 = Neutral; 4 = Satisfied; 5 = Very Satisfied.

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