FEASIBILITY ANALYSIS OF A NEW BUSINESS VENTURE:
MEDIMATCH, AN ELECTRONIC JOB INFORMATION MARKETPLACE
FOR HEALTH CARE PROFESSIONALS

by

STEPHEN E. MCGRADY

A.B., Mathematics & Russian Studies
Dartmouth College
(1978)

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE
DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1993

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Signature of Author: ____________________________
Alfred Sloan School of Management
May 13, 1993

Certified by: ____________________________
Erik Brynjolfsson
Thesis Advisor

Accepted by: ____________________________
Jeffrey A. Barks
Associate Dean, Master's and Bachelor's Programs

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Stephen E. McGrady

Submitted to the Alfred P. Sloan School of Management on May 13, 1993, in partial fulfillment of the requirements for the degree of Master of Science in Management

Abstract

The cost of health care has grown to an unacceptable percentage of the US GDP and continues to climb. As a result, health care reform was a central issue both in the 1992 presidential campaign and in the Clinton administration’s first 100 days. Contributing to the high cost of health care in this country is the expense of recruiting professional personnel: US hospitals spend $700 million annually to recruit registered nurses and allied health professionals (e.g., Radiologists, Respiratory Therapists, Physical Therapists). The current shortage of RNs and AHPs is expected to worsen as the economy recovers from recession and as society’s demand for health care continues to rise.

This thesis analyzes the current recruitment practices of American hospitals and proposes an information system, called The MediMatch Health Care Job Information Bank, as an alternative to hospitals’ traditional methods of recruiting professionals. The hypotheses to be tested are (1) that information technology can be employed to enable partial electronic market in this industry and (2) that the economies of scale and improvements in recruiting effectiveness achieved through the brokerage effect constitute a value proposition attractive enough to support a new venture whose purpose it is to provide this service.

The theory of an electronic marketplace is described and critical success factors are identified. Past and current electronic recruiting services in various industries are identified and analyzed, and additional CSFs for electronic recruitment are proposed. The acute shortage of and increasing demand for health care professionals is discussed and current recruitment practices are critiqued. An information service is proposed to meet the needs of both recruiters and professionals. Finally, product design, promotion and pricing alternatives are examined to determine the overall feasibility of such a new offering.

Thesis Supervisor: Prof. Erik Brynjolfsson

Title: Assistant Professor of Information Technologies and Management
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Acknowledgments

I would like to thank Erik Brynjolfsson for his support and guidance throughout this somewhat unorthodox thesis project.

I also wish to express gratitude to Dorothy McGrady, whose support made this research, and the MediMatch service, possible.

My children, Erin and Patrick McGrady Powers, have been extraordinarily patient and understanding of my long absences from home while I pursued my degree and my dreams.

Finally, I thank my wife and partner, Pat Powers, without whose strength and support none of what I have accomplished would have been possible.
Chapter 1: Introduction

The total cost of health care in the United States has grown to an unacceptable percentage of the GDP, and the growth is accelerating. As a result, health care reform was a central issue both in the 1992 presidential campaign and in the Clinton administration’s first 100 days. Contributing to the high cost of health care in this country is the expense of recruiting professional personnel: US hospitals spend $700 million annually to recruit registered nurses and allied health professionals (e.g., Radiologists, Respiratory Therapists, and Physical Therapists). The current shortage of RNs and AHPs is expected to worsen as the economy recovers from recession and as society’s demand for health care continues to rise.

This thesis analyzes the current recruitment practices of American hospitals and proposes an information system, called The MediMatch Health Care Job Information Bank, as an alternative to hospitals’ traditional methods of recruiting professionals. The hypotheses to be tested are (1) that information technology can be employed to enable partial electronic market in this industry and (2) that the economies of scale and improvements in recruiting effectiveness achieved through the brokerage effect constitute a value proposition attractive enough to support a new venture whose purpose it is to provide this service.

The theory of an electronic marketplace will be presented, along with a framework for assessing the suitability of an electronic market for a given product. Research identifying critical success factors for electronic markets will be introduced for use in the feasibility analysis. Past and current electronic recruiting services in various industries will be identified and analyzed, and additional CSFs for electronic recruitment proposed. Next, the health care
industry itself will be the focus of attention: the acute shortage of health care professionals will be explained, as will the rising demand for these professionals and the increasing financial pressures felt by their prime employers, the hospitals. Hospitals’ current recruitment practices will be critiqued and the need for an improved recruitment market demonstrated. An information service will be proposed which meet the needs of recruiters and professionals and adheres to the prescription of the proposed CSFs. Finally, product design, promotion and pricing alternatives will be examined to determine the overall feasibility of such a new offering.

Chapter 2: Theory of Electronic Markets and Electronic Hierarchies

This section defines the terms used throughout the thesis and exposes the theories of electronic markets and electronic hierarchies proposed by Malone, Yates and Benjamin. Anderson’s survey of ten electronic markets is analyzed and his critical success factors for formation of electronic markets are presented and discussed. This exposition lays the theoretical groundwork for the feasibility analysis which follows.

Definitions of markets and hierarchies

Markets and hierarchies are the two primary mechanisms that economies use to coordinate the movement of goods and services through adjacent steps in the value-added chain [Malone, Yates and Benjamin, 1987]. Markets rely on supply and demand forces and arm’s length transactions between individuals and firms to coordinate this flow. Market forces determine the product attributes (quality, service, price/cost, and effectiveness in use) for a product. The buyer of a good or service will compare many possible sources and choose the product whose
product attribute mix best matches the requirements of the down-stream process for which the given product is an input.

*Hierarchies*, on the other hand, coordinate the flow by controlling and directing it from a higher level in a managerial hierarchy. Managerial decisions, not market forces, determine the product attribute mix. The buyer does not evaluate many potential suppliers, but works with a single source. Often the hierarchy is simply a firm, but it may span two firms who have established a sole supplier relationship.

**Factors favoring markets or hierarchies**

As might be expected, these two mechanisms have their strengths and weaknesses, which can be described in terms of transaction costs. These include the cost of gathering and analyzing information, establishing relationships (e.g., contract negotiation), and protecting against opportunistic trading partners. The fundamental tradeoffs between markets and hierarchies can be summarized in terms of three classes of costs: *production costs*, *coordination costs*, and *vulnerability costs*. Table 1 gives the analysis of these costs done by Malone, Yates and Benjamin [1987].

<table>
<thead>
<tr>
<th>Organizational Form</th>
<th>Production Costs</th>
<th>Coordination Costs</th>
<th>Vulnerability Costs</th>
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<td>Markets</td>
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<td>Hierarchies</td>
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Markets allow buyers to select products which optimize their production process, thereby lowering their production costs. These buyers are also free to
select different suppliers at different times, thus holding down vulnerability costs. The coordination costs of this system are high: buyers must collect and interpret information from many sources and expend effort in establishing business relationships with the selected supplier.

Hierarchies are designed to minimize these coordination costs, by narrowing the choice of suppliers to the one selected by the managerial hierarchy. The resultant loss of freedom results in higher production costs, as the buyer is no longer free to choose the optimal product and its supplier. Vulnerability costs are high, as the buyer will have greater difficulty in switching suppliers.

Improvements in information technologies reduce these costs in a way which favors markets more than hierarchies. Since coordination essentially involves communicating and processing information, the use of information technology seems likely to decrease these costs. Information technology also affects other factors important in determining whether a market or hierarchy is preferable: asset specificity and complexity of product description [Malone, Yates and Benjamin, 1987].

An input to a firm’s value-adding chain that cannot be readily used by some other firm is said to be highly asset specific. Assets may be site specific (the bottle plant located near the brewery), physically specific (a specialized machine tool), humanly specific (a consultant with in-depth knowledge of a particular firm), or time specific (a truckload of perishable vegetables). Such assets are likely to be procured using a hierarchical rather than a market structure for several reasons. First, the high degree of specificity implies a need for an on-going relationship between buyer and supplier. Second, the specificity implies, ipso facto, that there are few suppliers of the product—too few to bring the benefits of a competitive
market. Finally, both buyer and supplier are vulnerable to opportunistic business practices, and so are inclined to select a managerial hierarchy for protection.

A product’s description is complex if it takes a (relatively) great amount of information to specify the product and its attributes. Since markets require a great deal of communication about the product to conclude a sale, complex product descriptions raise the coordination costs, often to unacceptable levels. Therefore, products with highly complex of product descriptions (e.g., an automobile engine) are more likely to be obtained through a hierarchy while those with simple descriptions (e.g., 100 bushels of hard red winter wheat in Kansas City in September) are easily bought and sold in markets.

These relationships are presented graphically by Malone, Yates and Benjamin [1987], and are reproduced in Diagram 1.
Impact of advanced information technologies

Technology has enabled markets and hierarchies to improve their efficiency and grow from local to national and global concerns. In the nineteenth century, the telegraph and railroad networks were the enabling technologies. Today, computers, databases and telecommunications networks allow markets and hierarchies to operate by exchanging information electronically. Thus, advances in information technology have given birth to electronic hierarchies and electronic markets. [Malone, Yates and Benjamin, 1987]
Information technology has enabled this development in three ways. First, advances in information storage, processing and communications have greatly reduced the costs of coordinating the flow of products in the economy, to the benefit of both markets and hierarchies. Malone, Yates and Benjamin [1987] term this the *electronic communications effect*.

The *electronic brokerage effect* primarily benefits markets. A broker is an agent who is in contact with many buyers and sellers. The broker facilitates interaction between suppliers and buyers by collecting, filtering and matching product attributes to requirements. This dramatically reduces the coordination costs associated with the market, as buyers and suppliers can exchange information once with the broker, rather than repeatedly with each potential trading partner. The electronic brokerage effect arises when many buyers and suppliers exchange information electronically via a central data base. Buyers are enabled to compare the offerings of many different suppliers quickly, easily, and inexpensively.

The *electronic integration effect* is evident when the supplier and buyer use information technology to create shared, "interpenetrating" processes at the boundaries between steps in the value-added chain. Such benefits are most easily captured by a hierarchical organization. One example of such an application is a Professional Information Network implemented by a hospital in the Midwest. This system simplified pre-admission and operating room scheduling, sped delivery of lab tests and fulfillment of prescriptions, and improved management of referrals between physicians and the hospital. [Madnick, Osborn and Wang, 1988]
Critical success factors for electronic markets

The type of product to be traded has much to say about the feasibility of establishing an electronic market [Malone, Yates and Benjamin, 1987]. Just like the traditional market and hierarchy, electronic markets are favored when the asset specificity of the product is low. Products with a high degree of specificity typically have few suppliers, which reduces the electronic brokerage effect. Further, purchase of such products often requires extensive coordination between buyer and supplier (e.g., consultation on design of a machine tool, precise timing of delivery for perishables). In such cases, the electronic integration effect dominates and the electronic hierarchy is preferred.

Electronic markets also require a fairly low degree of complexity of product description. Commodities and products with standardized descriptions can be traded easily in a market, as there is consensus on what the product attribute definitions mean. Highly complex product descriptions are difficult to formulate and to communicate. An electronic hierarchy is more likely to deal with such products.

Anderson’s survey of electronic markets discovered the degree to which these two factors influence the viability of an electronic market [Anderson, 1987]. Ten electronic markets were investigated. Of the seven successes, all but one had a low degree of asset specificity: the one exception was an airplane parts locator, where the demand was highly time specific, but the underlying asset was not perishable. Of the three failures, two had a high degree of asset specificity; the third failed due to implementation problems. These results support the theory electronic markets are ill-suited to products with high asset specificity.
Low complexity of product description is also predicted by the theory, and was generally found to be the case in this survey. However, one successful electronic market dealt in products with a high complexity of product description. Planning Research Corporation's Multiple Listing Service developed a complex schema and highly structured lexicon to describe the attributes of the real property in its database. This proved adequate to support supplier narrowing, the process whereby buyers identify potential suppliers and develop their "short list" of potential suppliers. The remainder of the transaction—final product selection, negotiation of price and terms, and funds transfer—were handled personally, not electronically.

A tentative conclusion can be drawn: "low asset specificity is a sufficient condition for the establishment of an electronic information market [for supplier narrowing]. Successfully creating a pure electronic market, however, requires both low asset specificity and low complexity of product description."

Anderson proposes three other critical success factors as a result of his study: an electronic market is likely to succeed if (1) the industry already employs market rather than a hierarchy, (2) the electronic market does not alter the roles of current market participants, and (3) the system does not reduce the role of historically powerful industry participants. [Anderson, 1987, pp. 78–79]

Having laid the theoretical groundwork for this feasibility analysis, attempts to create electronic markets for the recruitment of personnel will be reviewed and analyzed, and additional critical success factors will be proposed.
Chapter 3: Electronic Markets for Personnel Recruitment

In the case of personnel, the product being purchased is the labor of the individual being employed. The buyers are the employers, who use the services and talents of these employees to operate their businesses.

For the professional segment of the labor market, it is typical for “suppliers” (the professionals) to advertise their “product” (themselves) using a resume which states their experience, talents, and objectives. “Buyers” (the employers) state their product requirements in the form of job descriptions, and solicit bids on these positions by advertising their availability. Advertising may not produce the desired candidate for a reasonable cost. Enter the brokers—executive search firms, university career placement centers, and employment agencies—who act as concentrators and distributors of employment information, reducing the market’s coordination costs. Even so, this is a huge market: James H. Kennedy, publisher of the Executive Recruiter News newsletter, estimates that $1.5 billion is spent annually on searches for middle managers and high-tech executives. [Deutsch, 1990]

Advances in information technology have enabled the creation of recruitment databases, computerized collections of information on prospective employment candidates and job opportunities. The ability to key-word search these databases gives them a distinctive advantage over paper records. Combined with advances in telecommunications, and with the proliferation of personal computers, the electronic brokerage effect has given rise to a number of attempts to organize electronic recruitment markets. According to Kathleen Young Marcaccio, an editor at Gale Research, which publishes Computer-Readable Databases: A Directory and Data Sourcebook and the Directory of Online Databases, there were no listings
for career and employment databases in the 1981 issue of the *Directory*; by 1991, 22 such online services were listed in the *Directory* and 30 publicly available job databases could be found in *Computer-Readable Database s.* [Melia, 1991]

An industry survey revealed five major categories of recruitment databases [Willis, 1990]. Those maintained by executive search firms, by universities, and by employment agencies are three of the five; they represent advances in the technology employed by the traditional brokers in the labor market. Fourth are the databases open to the general public (often published by information services like Dialog, CompuServe, and Prodigy). Finally, there are a number of private recruitment databases maintained by employers.

**Executive Search Firms**

Most databases in this category are accessible only by the search firm’s recruiters. The databases typically include not only the resumes of executives and other professionals actively seeking jobs, but also those of individuals not currently in the job market (often these are executives who have been placed previously by the search firm) who might be lured away from their current position by the right offer. Professionals may submit unsolicited resumes to the search firm in hopes of being included, but it is more often the case that resumes are solicited by the search firm based on the reputation of the individual in his or her industry.

These databases allow search firms to do “targeted searches” to fill their clients’ job openings. Agencies are able to do so profitably because these computerized databases enable the search firm to sift through thousands of candidates to identify the handful with the unique combination of skills their clients’ positions require. Targeted searches are particularly attractive to employers because they
are charged a flat-fee based on the difficulty of the search, rather than a percentage (typically 30 to 35%) of the candidate’s annual salary. [Willis, 1990]

There is some movement toward opening these databases up to the public. The nation’s largest search firm, San Francisco-based Korn/Ferry, offers access to its database of middle management candidates (compensation in the range of $50,000 to $75,000 annually) to both its clients and non-customers for a fee. Significantly, Korn/Ferry does not allow direct access to its famous pool of executives earning over $100,000 annually. Another major player in this segment is CORS (Corporate Organizing and Research Service), which handles about 2,000 search assignments per year at $2,500 per assignment. [Willis, 1990]

HispanData is a recruiting service specializing in locating experienced Hispanic professionals. Its National Hispanic Resume Database contains more than 5,000 resumes, solicited from more than 250 college campuses and 150 professional Hispanic organizations, or received in response to monthly advertisements in Hispanic Business magazine [Glasheen, 1990]. HispanData does not allow clients direct access to its database; rather, HispanData searches for candidates matching its clients' requirements, pre-screen prospective candidates, and presents a slate of candidates for interview. A corporate client pays $10,000 a year for an unlimited number of searches. Smaller companies may list up to 10 positions a year for $5,000.

Another niche player in this category is The Cheshire Group, a search firm based near Philadelphia. The Cheshire Group introduced the Bank Executives Network, which specializes in recruiting executives for the thrift and banking industries, in September, 1988 [Wright, 1989]. Unlike many search firms, the Network welcomes unsolicited resumes from banking executives with salaries in
the $30,000-to-$100,000 range. Additionally the Network aggressively solicits
resumes using direct mail. Participating executives receive the Cheshire Report, a
monthly newsletter listing banking positions across the nation [ABA Banking
Journal, 1988]. In its first year of operation, the Network had amassed a database
of about 2,500 resumes [D’Addono, 1989].

Resumes are analyzed and data extracted in more than 100 categories, such as
income, educational degree, geographic preference, and specialties. Subscribing
institutions may request a search by specifying up to 30 search criteria. To
preserve confidentiality, only Cheshire employees have access to the database.
Furthermore, individuals whose resumes are selected in a search are contacted in
confidence by Cheshire. If the candidate is interested in the opportunity—and if
Cheshire’s interviewer believes that there is a good fit between the candidate and
the employer—the executive’s name is added to the slate of candidates given to
the employer.

Membership in the Network is limited to one banking and one thrift institution
in each market (except for the top 25 markets, where the limit is two of each
type). Members can request searches as often as they like for an annual
subscription fee of $9,500. Cheshire Group president Colin Hanna says that this
pricing scheme encourages repeat usage and builds long-term relationships
between Cheshire and its clients [Bank Letter, 1988]. By 1989, the Network had
twenty clients, and Hanna expected to triple its client base and quadruple its
resume database in 1990.

**University Databases**

Colleges and universities are offering job and resume databases as career
placement services to their students and alumni. Harvard, Cornell, Brown,
Pennsylvania and Stanford are among the hundreds of schools that have computerized lists of available positions and resumes of graduating students and alumni. The University of Florida’s Career Resource Center boasts an advanced database which features a job-matching system that allows students to sign up for interviews, e-mail their resumes to prospective employers and keep track of new job listings posted to the system. [Willis, 1990]

“Job hunting has entered the electronic age,” says Richard Stewart, Purdue placement director and president of the national College Placement Council, a trade group based in Bethlehem, Pennsylvania [UPI, 1991]. The Council’s 1990 survey found that 35% of college placement offices have some kind of electronic resume service. Increasingly, these databases are being interlinked to give students’ resumes broader exposure and to allow employers a single point of access to numerous resume databases.

Purdue, North Carolina State, Georgia Tech, and Iowa State are among the 1,500 universities participating in the kiNexus system. In 1991, the College Placement Council endorsed kiNexus because it allowed schools to both maintain their own databases and export resumes to a national service. Started in 1988 by Chicago entrepreneur Howard Tullman, by 1991 the kiNexus database contained 50,000 resumes of university juniors, seniors, and young alumni, who paid $25 each to publish their resumes. Tullman claims to have served 500 hiring managers in the first six months of 1991 [Melia, 1991]. The database is sold on a subscription basis—for $3,500 corporations receive the entire database, along with monthly updates, on floppy disk or CD-ROM—or on a pay-per-use basis—kiNexus will search its database for $25 a search, with an additional $100 fee if the search turns up one or more candidates [Spragins, 1991].
The Career Placement Registry offers a service similar to kiNexus, at a cost of $15 to the student. CPR is the oldest electronic recruitment service discovered in this research: it began operation on January 18, 1982 when it published its database of 1,040 students to more than 10,000 potential employers in 55 countries via the DIALOG Information Service [Kruoff, 1982]. By mid 1990, CPR could claim to have handled 125,000 resumes, about 60% of which were from students, with the remainder coming from more experienced professionals [Deutsch, 1990].

The Massachusetts Institute of Technology refers its students to Best North America, a company establishing a database of U.S. and Canadian graduate and post-doctoral students to complement a similar database it has developed in Britain. There is no charge to students to list their resumes and research interests on this database. Major corporations and universities in North America and Europe are Best’s target market.

MIT alumni are also eligible to participate in a unique database service, ProNet. Begun by Stanford University’s Alumni Association, ProNet is now a for-profit organization serving the alumni of several elite universities—Stanford, MIT, UCLA, UC Berkeley, Cal Tech, Cornell, Canegie Mellon and Michigan are members of the consortium of alumni associations which owns ProNet. For a one-time $25 fee, alumni can list their resumes with the service by completing an electronic registration form, supplied by ProNet on floppy disk. Annual updates are solicited by ProNet, and are free of charge. Confidentiality and security are maintained by limiting access to the database to the ProNet staff and by suppressing name and contact information from printed “profiles”. Only after a subscribing employer expresses interest in an anonymous candidate is the individual contacted by ProNet and asked if he or she wishes to have his name released to that employer.
The ProNet service is supported by corporate subscriptions. According to Dave Washburn of ProNet, some 150 companies paid $10,000 each to subscribe to the Pro Net database in 1992. Subscribers can make up to 10 successful candidate searches a year, where only searches resulting in a hire are counted as a success. In addition to database access, subscribing employers receive advertising of their current openings (alumni receive six biweekly listings of some 120-to-150 subscriber job openings when they first register with ProNet) and “mini-resume” books of individuals actively seeking employment (there is an additional $25 fee for alumni to use this service).

Other computer service firms offering databases of students and graduates include the College Recruitment Database, Graduating Engineers Employment Registry, Access: Networking in the Public Interest and JOBSource. [Willis, 1990]

Employment Agency Databases

Employment agencies are active users of all sorts of recruitment databases, with the larger agencies like Dunhill, Fortune Personnel Consultants, and Snelling & Snelling operating databases of their own. More characteristic of this segment are database networks operated by chains of franchised employment agencies and networks of independent agencies. A 1990 survey of 10,000 such agencies found that 27% belonged to a network and that the number was growing rapidly. [Willis, 1990]

Individuals using the services of the employment agency may authorize release of their resume to the agency’s network, gaining visibility to a wider base of potential employers. The network database serves employers by allowing recruiters to access a nationwide pool of candidates. Rich Lundgren, executive director for the Professional Employment Research Council, the trade association
for these networks, likens the benefit of network membership to those enjoyed by real estate brokers using the Multiple Listing Service. Also paralleling the real estate industry is the distribution of agency fees: when a candidate fills an opening, the fee paid by the employer is split evenly between the agency with the employer’s job listing (the “buyer’s agent”) and the agency that published the employee’s resume to the network (the “seller’s agent”).

Most of these databases specialize in a particular function or industry. The National Insurance Recruiters Association (NIRA) has 30 member firms nationwide; Insurance National Search (INS) has 36 members. First Interview (FI), a 125 member network, serves sales and marketing executives. Two less specialized database networks are those of First International Personnel Consultants (FIPC), with 50 member agencies, and National Personnel Associates (NPA). [Willis, 1990]

**Public Access Databases**

Public access databases are often published by electronic information services—like DIALOG, CompuServe and Prodigy—and are characterized by their ease of access. Unlike the previous three categories, individual and employers typically do not need not be clients of a particular firm or associated with a particular institution to become participants in these electronic recruitment markets. This characteristic is a mixed blessing: the increased breadth of these databases make them rich sources of employment information; the lack of screening normally performed by the brokers means that the databases contain many inferior products and participants must work harder to identify candidates/positions which meet their requirements.
DIALOG publishes the Career Placement Registry, discussed briefly in the section on university databases. Shortly after the introduction of its student service in 1982, CPR added experienced professionals to it database. Fees range from $15 to $40 per hour for professionals to post their resumes (fees are on a sliding scale based on the professional’s salary requirements). Employers pay $5 per resume or $50 per hour to search the database. [Computerworld, 1982]

CPR collects data on career objectives, personal background, work experience, salary requirements, language skills, special skills, unique qualifications and occupational preferences using a standard data entry form. The database contains between 3,000 and 10,000 resumes, depending on the time of the year, with 30 to 40 per cent of the resumes coming from experienced professionals [Van Camp, 1988]. According to CPR vice-president Harry Allcock, 500 corporations search the database in an average month [Herbst, 1990].

CompuServe publishes the Employers’ Jobnet, an “electronic employment communications network”, for use by employers, associations, college placement offices, outplacement firms, employment agencies, resume services, and recruiters. Individual job seekers cannot subscribe. Both job openings and resumes may be posted and searched, with SIC and SOC codes used to standardize industry and occupation descriptions.

Individual CompuServe subscribers are directed to the 150 special interest groups supported by the service. Besides lively conversation on topics of mutual interest, these SIGs provide a forum for the exchange of employment information. There are numerous anecdotes of computer analysts posting their resumes on the SIG and getting the job of their dreams, all electronically.
Prodigy is an information service targeted at the mass market, and its employment information services are the most general and easily accessible. USA Today classified ads can be posted to Prodigy: a 266 character message running for one week costs the employer an additional $60. Prodigy users can browse these ads without charge. The Adnet Employment Advertising Network allows employers to reach Prodigy’s one million subscribers (and about 500,000 subscribers on other PC networks) at an affordable price. Job listings may be searched by company name or employment category; candidates contact employers directly if interested in the position. [PR Newswire, 1991]

Prodigy is the delivery vehicle for the College Employment Association’s “Career Network”. Businesses pay $5,900 a year to communicate their job openings to college, university and vocational school career placement centers, which receive the service free of charge. Counselors can find job openings nationwide, and keep corporate recruiters informed about job fairs at their institutions. [Fasbinder, 1991]

Finally, Prodigy offers Peterson’s Connexion Services, a database of 30,000 job-hunter profiles. The Prodigy service supplements the paper data acquisition form that Connexion used from 1989 until 1991. Peterson’s (better known for its college and career guidebooks) offers job-seekers a six-month listing for $40. About 150 international corporations and federal agencies had used the service by the end of 1991. [Oldenburg, 1992]

A less well known publisher is Employment Telecom Systems, Inc. (ETSI). Founded in 1982, ETSI offers human resource professionals 70 databases of information on a wide variety of topics, including personnel news, current events, legal and regulatory information, advertising data, arbitrator profiles,
outplacement services, and databases of professional, technical, managerial, student, and military resumes. ETSI’s service is called the Human Resources Information Network (HRIN). [PR Newswire, 1982]

HRIN’s Resumes-On-Computer database contains more than 3,300 resumes collected from outplacement firms, printers, and professional resume-writing services. HR managers can search this database by keyword, or conduct full-text searches of the resumes themselves. An annual subscription to this service costs $1,790. [Eng, 1991] The College Recruitment Database (mentioned briefly in the discussion of university databases) was introduced in 1988. Graduating seniors and graduate students can arrange, through their placement director, to publish their resumes. In its first year, the service signed up 11 universities and published 7,000 resumes. [Link-Up, 1988] HRIN also distributes the Militran database, an employment transition service provided to retiring or separating U.S. military personnel. The database stores “mini-resumes”, with experience translated from military to civilian business terms. [Air Force Magazine, 1990]

Not all successful public access databases are associated with major information service providers. Career Technologies (formerly known as JobNet) allows members of 30 engineering, computer, mathematics, scientific and technical societies to publish their resumes for 60 days at no cost. With 1.5 million members able to use the service, the database usually contains 15 to 20 thousand resumes. The service also allows professionals to scan corporate presentations and listings of job openings. Employers pay an annual fee for this exposure, and for the ability to scan the resume database. The support of the professional societies help make this service successful. [Van Camp, 1988]
Other services identified in this research are the ALANET Grapevine (specializing in research librarians), Online Careers (offered free of charge to researchers subscribing to a $325 newsletter), Jobline (part of DIALOG’s ONLINE CHRONICLE serving online researchers), BPI Adline (technical professionals are guided to company’s online job listings and BPI technical job fairs), Scholarnet/Polinet (resumes of academic researchers and job opportunities in political science and public administration), Telecue Systems (featuring interactive ads for opportunities in the engineering and computer fields), the IEEE Consultants Networks (limited to IEEE members), and a long list of bulletin board services. [Van Camp, 1988]

Corporate Databases

Corporate recruitment databases typically contain the names of former employees, retirees, or contractors that the firm could call to fill a full or part-time opening. Firms may employ databases to keep track of these employment prospects, or, more significantly, hopeful job seekers who inundate them with resumes. Advances in optical scanning and database technology make the archival and retrieval of these resumes a much simpler process than in the days of paper records and filing cabinets.

A number of commercially available software packages have been developed to help recruiters manage their resume files. The market for these products breaks down into two classes: comprehensive HR management software with resume and requisition tracking modules, or stand-alone resume archival and retrieval systems.

Abra Mac Dabra’s Abra 2000, Control Data Business Management Services’ Repertoire, GENESYS Software Systems’ Human Resources System and Ross
Systems RossHR are examples of integrated systems. They feature the ability to generate a variety of reports (such as EEO compliance) and to pass information on new hires from the applicant tracking system into the main HR systems (like the payroll and benefits systems).


The Resumix system is one of the more advanced of this group. The resume is fed into a scanner (or a fax machine) to create an electronic image of the document. This scanned image of the original resume is stored in an on-line database. OCR software extracts relevant information from the resume, creating index words that enable key-word searching of the database. Candidates can be matched to open requisitions by matching key-words from the resumes and the requisitions. Benefits of the Resumix system are the elimination of the need for manual data entry and coding of information, the archival of resumes in an immediately searchable format, automatic matching of candidates resumes to job openings, and support for electronic communications (selected resumes can be faxed, e-mailed or printed out for hiring managers’ review).
Analysis: additional CSFs for Electronic Recruitment Markets

A number of lessons can be drawn from a review of the successful ventures in electronic recruitment services. Success is no sure thing in this industry. Indeed, many of the electronic recruitment services discovered in this research are no longer in business: Connexions (a Cambridge, Massachusetts firm—unrelated to the Peterson's system on Prodigy), Career System (a service of General Database Technology), CLEO (Computer Listings of Employment Opportunities), CARI (Computer Assisted Recruitment International), Alpha Student Placement, and HRS:NET. [Van Camp, 1988] Others services are cited once in the literature, never to reappear, such as Jobline and the Online Career Menu. It would not be surprising if, at the time of this research's publication, some of the services described above may have ceased operation. One possible casualty is the Bankers Executive Network, which could not be located in the greater Philadelphia area when attempts were made to update published data on the Network.

The Career Placement Registry is one of the few long-term survivors among the public access systems. CPR vice-president Allcock says: "In the early 80s, there were seven or eight firms that spent several millions trying to compete with us, and all of them in turn failed." Allcock cites three factors which favored CPR's success. [Herbst, 1990]

First, CPR did not attempt to push the service on brokers with a vested interest in the status quo—instead, they used a pull strategy, appealing directly to recruiters and job-seeking professionals. Second, by using the DIALOG service as a distributor of the service, CPR minimized resistance to purchase—no extra hardware or training was needed for DIALOG subscribers to use the service. Third, the service was offered to job-seekers for a nominal fee—firms seeking
substantial contribution from resume listing fees discouraged large numbers of users from signing up and were unable to achieve critical mass.

Another case of interest is Career Technologies, which enjoys the support of professional associations. Such sponsorship may result in financial support, but just as important is the favorable publicity generated among professionals and the credibility that accrues to the service among recruiters.

Further lessons can be learned from studying the ProNet case. In industries with shortages of professionals, the supply of active job-hunters must be supplemented by recruiting “happily employed” professionals if employers’ openings are to be filled. For these professionals, confidentiality is paramount—it is still taboo in American business culture to publicly circulate one’s resume without giving notice to one’s employer. ProNet’s extreme concern with confidentiality is an appropriate response to these concerns.

The HispanData example demonstrates the value of pursuing a niche strategy. By focusing on a demographic segment of the labor market in high demand, HispanData stands out from the competition as the only electronic market for Hispanic professionals. There appears to be a significant first mover advantage in the electronic recruitment industry. Once an electronic market can establish itself as the “Wall Street” where its commodity is traded, competing markets face a difficult challenge. (Note that this contrasts sharply with the biased service offered by the Bankers Executive Network, selling to only one bank in each market.) Identifying an unexploited, or underexploited, niche and becoming its standard for electronic recruitment seems the best path to success for a new venture.
Van Camp’s analysis echoes most of these findings: “After talking to many people in the field, it appears to me that the secret to success depends on having the support of professional organizations, a large pool of job seekers and available jobs, a specific niche, or having the database available on one of the widely used public search services.” [Van Camp, 1988, p. 26]

To state this more formally, an electronic recruitment market must first meet the tests for asset specificity and complexity of product description proposed by Malone, as well as Anderson’s three general CSFs for electronic markets. Furthermore, the following are proposed as critical success factors for an electronic recruitment market:

I) The service must be able to utilize a pull strategy, bypassing existing brokerages until critical mass is achieved with end users.

II) The end-user’s acquisition costs (including hardware, software and training) must be kept low.

III) The service must be priced to rapidly penetrate the market, thereby achieving a critical mass and capturing a first mover’s advantage.

IV) Support from a professional association is invaluable in achieving credibility and changing traditional job-hunting techniques in an industry.

V) The service must protect professionals’ confidentiality, especially if non-job-seeking professionals are expected to use the service.

VI) The service should be tightly focused on niche in the labor market where recruitment is a major issue, and a major expense, for employers.
Table 2 gives a subjective assessment of the electronic recruiting services discovered in this research, and the degree to which each of them successfully deals with the hypothesized CSFs.

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<td><strong>Exec Search</strong></td>
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<tr>
<td>Korn/Ferry</td>
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<td>CORS</td>
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<tr>
<td>HispanData</td>
<td>+</td>
<td>OK</td>
<td>–</td>
<td>OK</td>
<td></td>
<td>+</td>
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<td>Bank Exec</td>
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<td>OK</td>
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<td><strong>University</strong></td>
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<td>+</td>
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<td>ProNet</td>
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<td>Empl Jobnet</td>
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<td>Adnet</td>
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<td>Career Ntk</td>
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<td>OK</td>
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<td>OK</td>
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<td>Connexion</td>
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<td>HRIN ROC</td>
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<td>HRIN CRD</td>
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<tr>
<td>Militran</td>
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<td>OK</td>
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<td>+</td>
<td>–</td>
<td>+</td>
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<tr>
<td>Career Tech</td>
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<tr>
<td><strong>Corporation</strong></td>
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<tr>
<td>Resumix</td>
<td>OK</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td>OK</td>
</tr>
</tbody>
</table>

(“+” = Excellent; “OK” = Good; “-” = Fair; “--” = Poor; Blank = Insufficient Data)
A review of Table 2 suggests that a strong niche strategy can counterbalance the need for penetration pricing—relatively high prices are charged by firms with tightly focused markets, such as Korn/Ferry and HispanData. However, the Bankers Executive Network, which severely limits its enrollment and charges a high subscription price, may have gone too far in its violation of CSF III. This biased service appears to be at risk, and may have already succumbed to competition, a fate predicted for biased markets by Malone, Yates and Benjamin [1987].

A hypothesis of this thesis is that the recruitment of professionals by the U.S. health care industry represents a niche where an electronic recruitment service offered by a new venture could succeed. The middle sections of the thesis seek to substantiate this claim.

Chapter 4: Health Care Professionals in the U.S.

The health care labor market has three major segments: 1) Physician and Executive, 2) Professional, and 3) Hourly or Non-Professional. These are the "suppliers" of service. The "buyers" are the health care providers: hospitals, nursing homes, hospices, etc. The system operates as a market, and the process by which it operates is termed recruitment.

Physician and executive recruitment is done in much the same manner as executives are recruited elsewhere in the business world. Candidates are pre-selected on the basis of reputation, then individually approached and interviewed by a recruitment firm. Once a slate of qualified candidates has been identified, they are presented to the hiring executive or search committee for another round of interviewing. Eventually, the hiring executive or search committee makes a selection. Little or no advertising of the opening is done.
Professional employees include Registered Nurses (RNs), Allied Health Professionals (AHPs), such as Radiologists and Physical Therapists. Also included in this segment are the non-executive managers of these two types of professionals, such as Head Nurses and Clinical Laboratory Managers. In contrast to physician and executive recruitment, professionals are recruited by a process which makes extensive use of mass advertising and promotional activities. Once a pool of professional candidates has been attracted by an employer's advertising and promotion activities, they are screened by an in-house recruiter. After screening applicants, the recruiter gives the hiring manager a slate of most qualified candidates. The hiring manager interviews this slate and then makes a selection.

Recruitment of hourly or non-professional employees utilize employment offices to take applications from prospective employees. There is usually no lack of qualified candidates for these positions, and the recruitment expenditures for this segment are relatively low.

The first group may be ripe for an electronic market, but the dominating presence of executive search firms violate Anderson's third critical success factor (the system should not reduce the role of historically powerful industry participants). A new enterprise would meet stiff resistance were it to attempt to establish an electronic market in this segment. The third group is little different from the labor market at large. The niche critical success factor warns against attempting the creation of such a general recruitment service. There is too little motivation to change the status quo and too little is spent on recruiting these employees to support the brokerage fees that would be charged by the electronic market maker. Therefore, this feasibility analysis will be limited to the second group, the professional employees.
The Suppliers: Health Care Professionals

In 1989, the American Nurses Association (ANA) estimated the total number of Registered Nurses at 2,082,750 (a 20% increase over 1980). Of this total, 1,666,200, or about 80%, were employed as RNs (compared to 70% in 1977). Most nurses are women, but a growing number of men are graduating from nursing schools—nearly 6% of the 1988 nursing school graduates were men. [NAHCR, 1992]

Nursing has been a young person’s profession, but this is changing. The median age for a nurse is now 39 and increasing. [ANA, 1991a]

To become an RN, one must complete a two-year associate degree program, a three-year diploma program in nursing, or a four-year baccalaureate degree (BSN) program. Further, the candidate must pass a state licensing examination to become a licensed nurse, and renew this license every few years. [ANA, 1991a]

Continuing education is a condition of license renewal.

The most important trend in nursing is specialization. After advanced educational preparation and experience, nurses are performing functions beyond those of the traditional RN. These include: total health assessment; physical and mental exams; diagnosis, treatment, and referral; care coordination; and health education. The ANA uses a categorization scheme of 18 specialties with 205 subspecialties in its Nurse Placement Center. [The American Nurse, 1992]

A related trend is certification. In 1975, the ANA offered three examinations in three practical areas and certified 500 nurses. In 1991, the ANA offered examinations in 20 clinical and administrative areas, and has certified more than 70,000 nurses. [ANA, 1991b] In a survey of 43 credentializing agencies in the U.S., a total of 39 nursing certifications have been identified. [See Appendix 1]
Specialization and certification also characterize the other half of the health care professional segment, the Allied Health Professionals (AHPs). These specialists typically employ highly sophisticated equipment or procedures to assist physicians and nurses in delivering primary patient care. Radiologists, respiratory therapists, and physical therapists are typical AHPs. This is a highly fragmented segment of the labor force, and summary statistics for the number of AHPs in the industry are not available. A survey of the industry has identified 19 credentializing agencies and 60 different AHP certifications. [See Appendix 2]

The trends toward specialization and certification have favorably influenced the likelihood of establishing an electronic market. Dolan and Hoffman, in their article on employment want ads, point out the problem with inconsistency in job title nomenclature; they recommend a Menu of Job Titles to resolve this issue. [Dolan and Hoffman, 1986, cited in Van Camp, 1988] While the complexity of the work performed by health care professionals is higher than ever, specialties and certifications have created a common vocabulary, making the complexity of product description moderately low. This analysis suggests an additional critical success factor for electronic recruitment, not revealed in the preceding discussion of the industry review:

VII) Industries with highly specialized job functions and a high level of certification improve the viability of the service by reducing product description complexity.

The asset specificity of this labor is also relatively low. While a professional’s familiarity with a given health care provider’s methods and procedures suggests a fair degree of human specificity, these procedures are sufficiently standardized to allow professionals to move freely from employer to employer and to permit
nation-wide and international recruiting of these professionals. In the words of one nurse recruiter, “an ICU nurse is an ICU nurse.”

This recruiter is probably going too far—the complexity of product description cannot be rated as low, as these professionals are not uniformly graded commodities. No recruiter would hire these professionals without interviewing them and evaluating their unique qualifications and experiences. This case is roughly analogous to the Multiple Listing Service described by Anderson: the moderate complexity of product description enables supplier narrowing, but is insufficient to support a pure electronic market [Anderson, 1987].

**Supply Analysis: a chronic shortage of health care professionals**

There is a chronic shortage of RNs and AHPs in the U.S. It takes between 30-90 days to fill most RN positions, while many of the specialty positions can go unfilled for several months. In 1991, 8.7% of all RN positions went unfilled. [AHA News, 1992] AHPs are in even more scarce supply: 70% of recruiters said physical therapists continues to be the hardest position to fill. [Nursing91, 1991]

This is a continuation of the cycle of shortages experienced in the 1980s: high RN vacancy rates were reported for the first two years of the decade, followed by a steep decline after implementation of the Prospective Payment System (a fixed fee reimbursement plan for Medicare patients, discussed further in the analysis of hospital economics, below), returning to a severe shortage in 1986, and persisting through 1989, when 12.7% of all RN jobs went unfilled. [AHA, 1990b]

Recent years have seen a softening of the shortage. The RN vacancy rate declined to 11.0% in 1990. Regional variation ranged from virtually no shortage (5.3%) in New England to severe shortage (15.2%) in the West South Central. [AHA,
1990b] This trend continued with a 8.7% vacancy rate in 1991. The average hospital had 42 RN vacancies in 1988, but only 30 in 1992. Similarly the number of RNs to be recruited dropped from 100 to 70 in this period.[NAHCR, 1991]

Connie Curran, editor of Nursing Economics, warns that the decline is temporary and that the shortage of health care professionals by 2000 will be critical. She has noted a negative correlation between the general state of the economy and the RN vacancy rate and credits the recent recession for the temporary relief from the severe shortages experienced in the late 1980's. [Curran, 1992]

As previously noted, the typical RN is a women in her late 30s or early 40s. For many RNs, theirs is a “second income”; in the expansion of the 80s, many RNs reduced their hours of work to part-time, or exited the work-force entirely. With the onset of recession, many of these RNs have gone back to work, or increased their hours, in order to replace the income lost when their spouses were laid off. Curran predicts a shortage even more severe than that of the late 80s once the economy recovers and hiring increases, noting that historically the RN vacancy rate climbs faster in recovery than it drops in recession.

More deeply rooted than this economic cycle effect is a fundamental shift in the relative attractiveness of nursing as a profession. In 1988, Secretary Bowen of the Department of Health and Human Services appointed the Commission on Nursing to review the nursing shortage. The Commission found that the shortage did exist and was caused by increased demand [to be explored in the discussion of the “buyers”, the health care providers] and declining enrollments in nursing schools. [NAHCR, 1992]

Declining enrollments can be partially explained by the demographics of the nursing profession. Since the days of Clara Barton, nursing has been a female
profession, viewed by many as the career of choice for women with professional aspirations. Changes in U.S. society, most importantly the women’s liberation movement in the 70s and 80s, have opened up many more professional career opportunities to women. Furthermore, many women who are interested in health care as a profession now pursue an MD rather than an RN degree. Few men are opting to fill this gap (men accounted for only 6% of graduating nursing students in 1988)—hence, the decline in enrollments, and so, in supply.

Analysis of the shortage of AHPs is more straight forward. The rate of technological innovation in health care is astounding. For example, in 1982, nuclear magnetic resonance imaging technology was just moving out of the chemistry and physics laboratories and into large medical centers. Data for 1991 show that 1,036 of 5,342 community hospitals offer MRI services [AHA, 1993, p. xlix], and so must employ the highly specialized AHPs required to operate the NMR equipment. The same trend is true for specialized procedures, such as physical therapy. The training programs simply cannot be set up fast enough to meet the surging demand for AHPs.

Chapter 5: Health Care Providers in the U.S.

The demand for health care professionals is highly concentrated in one segment of the health care provider industry. As Table 3 shows, most RNs are employed by hospitals. [ANA, 1991a]
Table 3

Employment Settings of Employed RNs

<table>
<thead>
<tr>
<th>Type of Employer</th>
<th>% Employed Nurses</th>
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<tbody>
<tr>
<td>Hospitals</td>
<td>67.9</td>
</tr>
<tr>
<td>Ambulatory Care Settings</td>
<td>7.7</td>
</tr>
<tr>
<td>Community Health</td>
<td>6.8</td>
</tr>
<tr>
<td>Nursing homes</td>
<td>6.6</td>
</tr>
<tr>
<td>Student Health Service</td>
<td>2.9</td>
</tr>
<tr>
<td>Nursing Education</td>
<td>1.8</td>
</tr>
<tr>
<td>Occupational Health</td>
<td>1.3</td>
</tr>
<tr>
<td>Private Duty Nursing</td>
<td>1.2</td>
</tr>
<tr>
<td>Self-Employed</td>
<td>.8</td>
</tr>
<tr>
<td>Other</td>
<td>2.7</td>
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</table>

This mix is changing over time. In an increasing number of clinics and new health care centers, RNs are providing the majority of care. For instance, home care has grown to a $9 billion industry, with RNs as the main providers of this service. The reason for this is simple: the cost of an average day of institutional care is at least nine times greater than the cost of a day of home care. [ANA, 1991b]

Despite these changes, hospitals remain by far the dominant health care providers in the U.S. Preliminary government projection put 1991 national health care expenditures at $738 billion, more than 13% of GNP. Hospitals were 38% of this total, or $280 billion. [AHA, 1993, p. xxxiv] Because of this industry dominance, the “buyer” side of this feasibility analysis will be limited to hospitals.
The Buyers: Hospitals

As of 1990, there were 5,903 short-term or acute care hospitals in the U.S. registered with the American Hospital Association (AHA). When long-term facilities are included, the total rises to 6,720. This figure represents a 3.5 decline (from 6,965 to 6,720) between 1980 and 1989. Hospital closures were concentrated among rural institutions, although in 1989, rural hospitals still constituted 46% of the nation's total community facilities. Consolidation and merger were other factors contributing to the decline. Table 4 gives the break-out by type of community. [AHA, 1990b, p. 12]

Table 4
U.S. Hospitals, by Type of Community

<table>
<thead>
<tr>
<th>Type of Location</th>
<th># AHA Hospitals</th>
<th>% AHA Hospitals</th>
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<tbody>
<tr>
<td>Rural</td>
<td>2,667</td>
<td>45%</td>
</tr>
<tr>
<td>Urban (&lt; 1 Million)</td>
<td>1,744</td>
<td>30%</td>
</tr>
<tr>
<td>Urban (&gt; 1 Million)</td>
<td>1,492</td>
<td>25%</td>
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</table>

These closures and consolidations into larger, multi-hospital groups are an outcome of the societal and economic pressures on U.S. hospitals.

Hospitals are caught in a dilemma. On the one hand, they are being required to deliver ever more expensive, highly technical health care; to deal with an older, more critically ill patient; and to provide more charitable care. On the other hand, they are being brought under increasing pressure to reduce the cost of health care and its percentage of the GNP. Society demands more health care, but at a lower cost:

“By the year 2000, national health spending is projected to increase to over $1.6 trillion, representing per capita spending of $5,712 (more than double the 1991 per capita amount) and
accounting for over 16% of GNP. Such projections raise legitimate concerns about the impact of health care costs on both individual pocketbooks and national competitiveness in an increasingly inter-dep

dependent global economy." [AHA, 1993, p. xxxiv]

The major health care event of the 1980s was the federal government's switch to the Medicare Prospective Pricing System (PPS) in 1984. Under this system, hospitals are paid, prospectively, a fixed amount for services provided to Medicare patients. In recent years many hospitals have been losing money on Medicare patients. With the aging of the population, many hospitals, increasingly, will come to depend almost completely on Medicare. The shortfall caused by reimbursements not keeping up with inflation will increase. [AHA, 1990b]

Society expects hospitals to play an active role in responding to social problems, like the large number of Americans without health insurance, AIDS victims, victims of violence, the homeless, abandoned babies, and the mentally ill. Increasingly hospitals find themselves providing charity care to the estimated 34 million Americans without health insurance, and millions more who are under-insured. Throughout the 80s, the reimbursement shortfall grew for both charity care and Medicaid. In 1989, the total combined shortfall (Medicaid shortfall plus unsponsored care) was 13.2 billion dollars. [AHA, 1990b]

At the same time, private insurers began to question both reimbursement amounts and health services delivered, and implemented policies such as pre-admission certification and insistence on second opinions. The new methods of reimbursement, in failing to keep pace with the rate of inflation, have contributed to the general difficulty hospitals are experiencing in adequately covering their expenses. Total net margins have been in decline since 1984, the peak for the
decade. Calendar year 1990 ended with a negative net patient margin, meaning that patient revenues now fail to cover hospital operating expenses. [AHA, 1990b]

Demand Analysis: an increasing need for health care professionals

During the 1980s, total hospital expenditures increased 134%. Large increases were observed for intensive care unit (ICU) beds in the early 80’s. Between 1985 and 1989, the number of ICU beds increased from 83,439 to 88,654 (this even though the total number of ICU units decreased from 6,905 to 6,472). A complementary development was the explosion in outpatient services. Outpatient visits to all AHA-registered hospitals increased 89 million visits or 34% between 1980 and 1989. [AHA, 1990b] The average daily patient census has declined from 82% in the early 1980s to 72% in 1990 and 69% in 1991. [NAHCR, 1991] The trend is toward fewer admissions, but those patients who are admitted are more seriously ill and require more expensive and labor-intensive treatment and care.

During this period, the total number of full-time equivalent (FTE) personnel employed by hospitals increased 10% (from approximately 3.5 million to 3.9 million). This increase in the number of FTEs meant that by 1989, there were over 3 FTEs per bed, compared to 2.6 in 1980. Throughout the decade, labor-related expenses comprised the largest component of hospital costs, accounting for 55% of the hospitals' total expenses. Most of the increase in FTEs is in the professional segment, the RNs and AHPs. As a percentage of total nursing personnel, the number of RNs has increased 30% in the last 20 years (from 33% in 1968 to 63% in 1988). Hospitals have increase their use of FTE RNs by 26.3% and part-time RNs by 54% in the last decade. [AHA, 1990b]
This increase in the demand for personnel is because hospitals are serving more, not fewer, people through their outpatient and community programs, and the patients who are admitted are sicker and require more expensive care. Another contributing factor is the fact that health care technology, unlike technology in other industries, is not labor-saving, but labor-intensive. [AHA, 1990a] Thus the need for employees has been increasing, especially for those providing direct patient care, like RNs, and those trained to operate the special equipment or perform special procedures, the AHPs. The trend is not expected to abate: estimates say the country will need more than 2.6 million nurses by the year 2000 to address the changing health care needs of a changing society. [ANA, 1991b]

This rise in demand for health care professionals, coupled with the chronic shortage of RNs and AHPs, has forced hospitals to employ expensive recruiting campaigns to attract the necessary talent to their institutions.

**Chapter 6: Hospital Recruitment of Health Care Professionals**

Health care recruitment encompasses the products and services used by health care employers to attract, screen and hire health care personnel. The short and long-term forces operating on the supply and demand of RNs and AHPs have created a critical situation in professional recruiting. Hospital recruiters are being forced to maintain and increase recruiting expenses in an effort to attract professionals to their institutions.

**Current recruitment practices**

Marketing services for the recruitment of Nurses and Allied Health Professionals includes advertising agency services (market research, creative services, ad
placement, fulfillment), print media (space ads, classified ads, career directories), promotional material (brochures, fliers, videos, giveaways) and job fairs.

Complete information on the amount of money spent on by all health care employers to recruit professional employees is not available. Hospitals, which employ the majority of these health care professionals, spend about $1.8 billion a year on professional recruitment. About 38%, or $700 million, is spent on advertising alone. [Nursing92, 1992] An average hospital has a recruitment budget of $277,473, which is divided as shown in Table 5.

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<table>
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<tbody>
<tr>
<td>Advertising</td>
<td>38%</td>
<td>$105,440</td>
</tr>
<tr>
<td>Salaries</td>
<td>34%</td>
<td>94,341</td>
</tr>
<tr>
<td>Materials</td>
<td>10%</td>
<td>27,747</td>
</tr>
<tr>
<td>Travel</td>
<td>6%</td>
<td>16,648</td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
<td>33,297</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>$277,473</strong></td>
</tr>
</tbody>
</table>

Despite the "softening" of the nursing shortage, hospitals are spending more on recruiting, on a per hire basis, than ever before. As of 1991, the cost per hire for RNs stood at $2,396, a 12.6% increase over 1990. Total recruitment budgets were about flat (down 1.5% from 1990) after 23% and 26% increases in the previous two years. The number of recruitment trips was up to an average of 16 per year in 1991, more than any year since 1980. The percent of hospitals using recruitment agencies (a practice that recruiters deplore because of the high expense—as much as 33% of the professional's annual salary—paid to the agency) rose 3-4% to 37%. [Nursing91, 1991]
Hospitals are going to extreme lengths to attract the attention of Nurses and Allied Health Professionals. For example, a West Coast hospital sent out a direct mail piece to thousands of professionals. Inside was a packet of seashells and sand and a letter with the headline: “For a great career, just add water.” Job fairs, open houses and exhibition halls at professional conferences have a carnival atmosphere, complete with elaborate “gimmick” giveaways. Recruiters from Hawaii hand out leis and macadamia nuts along with literature about their institution. Institutions from the Southwest hand out packets of cactus seeds.

Once a recruiter identifies an interested and qualified specialist, no expense is spared to recruit that individual. Recruiters will send out elaborate 4-color portfolios, and on occasion use videotaped presentations, to inform professionals about their institution. For example, a nationally recognized research and teaching hospital spent $25,000 to produce a short informational video; the hospital spends $7.20 to mail a copy to each qualified professional responding to its space ads. [Pace, 1992]

The chronic shortage of supply for RNs and AHPs explains much of this behavior. Here the “buyers” are competing among themselves for scarce resources. The “suppliers” need spend little effort on promoting themselves. Rather, the buyers are spending great sums to secure the necessary inputs to their value-added chains. The coordination costs of this market are high, and the potential application of information technology to reduce these costs makes an electronic marketplace potentially feasible.

**Recruitment advertising for health care professionals**

Hospitals use a mix of advertising media and promotional activities to first attract the interest, and then fully inform the professionals about their institution:
• Print: Newspapers, professional journals, career directories
• Personal Contact: Open houses, job fairs, career days, exhibits
• Printed Material: Brochures, folders, flyers, direct mail
• Audio/Visual Material: Films, slide presentations, video tapes
• Broadcast Media: Radio and TV
• Public Mass Media: Billboards
• Direct Mail
• Electronic Ads

While each of these methods has its advantages, print advertising dominates the market, consuming 38% of a typical hospital’s recruiting budget (and 58% of its non-salary recruiting expenses). [Nursing92, 1992]

Two major types of print ads are used by employers: “job ads” and “image ads.” Job ads are usually small, black-and-white, briefly worded announcements about the availability of a specific position. They do not usually contain graphics. Job ads typically run in the newspaper classified section, but some job ads are placed as small space ads in the national journals serving RNs and AHPs.

Image ads, on the other hand, are space ads, usually using graphics, and often using spot or 4-part color. Image ads do not advertise any specific position, but tout the general benefits of working for a particular employer (e.g., pleasant location, benefits offered, caring attitude of management, challenges/rewards of the profession). Image ads are found exclusively in professional journals and career directories.

The choice of whether to use a job ad or an image ad is a function of the immediacy of the need. Job ads are easy to prepare and easy to change. They are the medium of choice for attracting applicants to fill an immediate need. Job ads may be placed locally (local newspapers), remotely (out-of-town newspapers), or nationally (professional journals). The decision on where to place job ads is
driven by two things: the degree of skill required for the position; and the local labor market's supply. The more skilled the position and the smaller the local labor market, the more likely it is that an employer will choose remote or national publication.

Image ads, on the other hand, are expensive to develop and hard to change. They typically run without change for several months in a row. Publishers promote image advertising as an investment, establishing the institution in the consideration set of potential employees. Thus, image ads are used by hospitals which are trying to create a favorable general impression of their institution, in the hopes that professionals will recall their hospital when making a job change.

**Analysis: recruitment advertising expensive and ineffective**

Advertisers are unwilling to cite specific response rates to image ads. Interviews with leading health care recruiters indicate that response rates for space ads in national journals is unacceptably low. It is not uncommon to run an image ad for months and get no response. And these ads are not inexpensive: a full-page, black-and-white ad in one of the monthly nursing journals costs from $3,500 to $6,000. Ads in the annual career directories published by these journals start at $10,000. [SRDS, 1992]

Job ads are somewhat less expensive and considerably more effective. A survey of the top 10 California newspapers classified ad rates found the average cost per line/inch to be $11.50. A twenty-line ad running twice a week would cost $920 per month. [SRDS, 1992] The response rate to these ads is unavailable, but anecdotal evidence suggests that classified ads are an effective way to reach the local labor market: recruiters tell of getting dozens of calls on Mondays following their advertising in the Sunday papers.
Thus, job ads seem to be an effective tool for recruiting health care professionals, provided that the local market of professionals is large and that the opening is not highly specialized. In small labor markets, or in the case of a hard-to-find specialty like a Nurse Anesthetist or Physical Therapist, newspaper circulation is inadequate to attract a sufficient number of qualified candidates. In these cases, recruiters may turn to the more expensive, less effective national job ads in the backs of the journals. Other alternatives include image ads (which are ill-suited to recruitment for a specific opening), one-on-one recruitment at conferences or job fairs, and direct mail to pre-qualified lists of professionals (a somewhat sophisticated practice employed by only a few leading-edge recruiters). [Pace, 1992]

On a more fundamental level, recruitment advertising is inefficient because of a fundamental mismatch between the capabilities of the print advertising medium and the complexities of the employment/hiring decision for professionals. Just as employers evaluate a complex set of characteristics when hiring people, these professionals choose jobs based on their evaluation of a complex set of criteria (e.g., location, benefits, salary, educational opportunities, family situation, professional challenge, employer culture, etc.).

Space and classified ads only permit the delivery of a very simple message for a very brief period of time. This means that an institution is forced to select a single idea in hopes of attracting the professional’s interest. As a result, they fail to attract some of the people who would truly be interested in their value proposition, but who fail to be motivated by a particular ad. This also means that institutions must spend additional money mailing literature which expresses their full value proposition to people who responded to their ads, but are not truly interested in what the hospital has to offer.
Despite the money and attention being lavished on them, health care professionals are also frustrated with the quality of information dissemination present in current recruitment advertising. A panel of nurses asked to evaluate recruitment ads was extremely critical of their lack of specificity. Said one RN, “in this day and age, we’re busy people. We want to know how this benefits us, and we want to know now... You don’t want to have to wait and have to write reams of letters or take the time to be put on hold by the personnel department to get the information.” Said another, “[t]his has more of what I look for—it explains exactly what’s going on in the facility. It tells what shifts are available and some of the more practical aspects. They also mention some of the benefits, such as 100% tuition reimbursement. That’s exactly what I’m looking for—specifics.” [Laabs, 1991]

The coordination cost of collecting information about alternative employment situations is different for different types of job-seekers:

- job seekers who know which institution that they want to go to (e.g., Pacific Presbyterian Hospital in San Francisco) have the easiest time—they contact that employer directly.

- job seekers who have a specific location in mind (e.g., the San Francisco Bay Area) identify potential employers by consulting the local newspapers (four major papers cover the Bay Area) or the Yellow Pages. They may also refer to professional journals, career directories, colleagues or a placement agency.

- job seekers who do not have a specific institution or geography in mind (e.g., a neonatal intensive care nursing position, working 3 days a week, 12 hours a day, with full benefits) face the monumental task of scanning numerous local newspapers, all the journal ads, and career directories to search for candidate
employers. These job seekers may turn to placement agencies, which provide a brokerage service for the industry, or they may hire on with the first hospital that offers something close to what they desire. In any case, their search and analysis will be incomplete and their choice of employment may be suboptimal.

Having identified potential employers, professionals must then determine whether these hospitals currently have openings. To gather more detailed information on the institution and its current job openings, they may use the direct response “bingo cards” found in the professional journals (and wait an average of six weeks for a response), or contact the institution directly via telephone or letter. Job seekers then face the task of analyzing information from various hospitals; inconsistent terminology and widely varying formats make this comparison difficult.

In summary, the absence of a channel for exchange of detailed job information and employer qualifications forces both hospitals and professionals to rely on the simple messages and emotive signals communicated via image and job ads. Since these signals are subject to misinterpretation, the recruitment process is inherently inefficient. The process of acquiring and analyzing detailed information is laborious. An electronic information system which enabled communication of detailed information in both directions could create a beneficial electronic brokerage effect and improve the efficiency of recruiting in this industry.
Chapter 7: Feasibility of an Electronic Market for Health Care Professionals

This feasibility analysis will first evaluate the health care recruitment industry using Malone’s paradigm, then proceed to a critical success factor analysis, using Anderson’s CSFs, plus others hypothesized in this study.

Asset specificity and complexity of product description

The labor market is somewhat unique in that the suppliers have a great interest in how their product (their labor) will be used by the buyers. Therefore, suppliers require much more information about buyers than is the case when selling a commodity. (This explains the presence of job openings databases as well as resume databases in the electronic recruitment industry.) This is especially true in cases where skilled labor is in short supply and buyers compete for access to this scarce resource. The bargaining power of suppliers rises to the point where buyers are seen courting suppliers, and the job opportunity seems to be the product being sold.

The health care professional market is such a case: professionals are selling their skills to hospitals and hospitals are selling their jobs to professionals. A complete structural analysis of this situation must consider the asset specificity and complexity of product description for both the real product, the professional’s labor, and the “shadow” product, the hospital’s job opportunity.

The professionals’ services have a low degree of asset specificity. “An ICU nurse is an ICU nurse” and can work at any hospital with only a minimum of retraining. Similarly, professional jobs have a low degree of asset specificity. An ICU job is attractive to a great many ICU nurses.
The complexity of description of the professionals’ services is moderately high. These are individuals, with varying degrees of talent and experience, and with unique personality traits. However, the high degree of specialization and certification of these professionals lowers the complexity of description to a considerable degree. Professional jobs have a comparable degree of complexity. It is difficult, if not impossible, to fully describe the working atmosphere and culture of a hospital, but it is possible to describe the job opening in terms of specialty and location, the professionals’ primary screening criteria.

Applying Malone’s framework, as modified by Anderson, allows one to conclude that the health care recruitment industry favors a market structure and that an electronic market which enables supplier (and buyer) narrowing is theoretically feasible.

**Evaluation of critical success factor compliance**

The health care recruitment operates today as a market, particularly in the subsegment of hard-to-recruit professional specialists. The presence of brokers in the market and the high coordination costs incurred by the industry support this observation. This satisfies Anderson’s first critical success factor (the industry already employs market rather than a hierarchy).

Recruiters’ roles can be left unchanged with a properly conceived electronic market. Allowing them to post only the jobs for which they are actively recruiting (e.g., hard-to-find specialists) means that their workload will not increase. Allowing them to use the telephone, fax or mail to list jobs means that their offices need not be equipped with PCs and modems to use the service. (See the PERX discussion, below, for analysis of an electronic market in this industry which failed to meet this CSF.) Professionals roles remain unchanged. This
satisfies Anderson’s second critical success factor (the electronic market does not alter the roles of current market participants).

Recruitment agencies will undergo a role change if the electronic market becomes wide-spread. Their role as brokers will decline, though their role in the administration of temporary employees will remain. Agencies may welcome the rise of an electronic market, since it would provide them with much more complete information about the market. Agencies could drop the pretense that they are impartial brokers (a role which they fulfill poorly today) and assume the roles of purchasing agents, if representing the hospital, or talent agents, if representing the professional. In this scenario, agencies would become primary customers of the electronic information service. However, this is speculation; the important issue is whether the strength of the agencies’ position in the industry would enable them to block an entrepreneurial attempt to establish an electronic market. The relative strength of these players in this segment of the industry is weak, so the possible role change is not overly troublesome.

The publishers, on the other hand, are a powerful force in the industry. Newspaper publishers would see some decline in their classified ad revenues from hospital job ads, but this is a small enough percentage of their revenues that it is unlikely to stir them to action. The journal publishers are likely to see a considerable decline in revenues and can be expected to make a competitive response. Thus, Anderson’s third critical success factor (the system does not reduce the role of historically powerful industry participants) is not fully satisfied, and to be feasible, a new electronic information service must devise a strategy in anticipation of the publishers’ response.
Analysis of the critical success factors proposed earlier in this thesis are also favorable to the idea of establishing an electronic health care recruitment market.

I) The service can utilize a pull strategy by using direct mail with the hospitals, a highly concentrated buying group, and space ads with professionals. Significant economies of scale allow the service to advertise at much higher levels than can individual hospitals. Both campaigns can be supplemented with publicity releases to industry associations, educational institutions, and the news media.

II) The end-user's acquisition costs can be kept low by designing a service that uses advanced information technology at the service node, while allowing use of more primitive telecommunications technologies (mail, telephone, fax) by end users. Some electronic communications effect benefits are lost, but this is insignificant when compared to the barrier to adoption that the cost of new technology represents. The service design should be flexible enough to add advanced communications facilities in the future. Cooperative arrangements with the information service providers (like DIALOG, CompuServe and Prodigy, which have proven to be interested in distribution partnerships with electronic recruiters) may prove the most cost-effective way of extending the electronic market to more technically sophisticated clients.

III) The service can be priced to rapidly penetrate the market. Penetration pricing allows the service to establish critical mass: since this is a network service, one can expect network externalities, also known as the bandwagon effect—the more clients using the service, the more valuable it is to all participants. Thus, penetration pricing allows the service to achieve a first
mover advantage in the market. By offering varying levels of market participation, low-priced subscription can be used to build volume in the basic listing service. Subscription is favored over usage-sensitive pricing for the listing service, as this keeps the administrative costs of the system low. Money-back guarantees can be used to reduce the clients’ risk of subscription.

IV) A number of professional associations exist in this industry. Associations can be solicited for support in educating professionals and employers about the benefits of the service.

V) The service can be designed to protect professionals’ confidentiality. Coding resumes with personal identification numbers is the obvious solution. The decision to minimize electronic access to the database by end users also serves to enhance security and confidentiality.

VI) An electronic health care recruitment service targets a niche in the labor market where recruitment is a major issue, and a major expense for employers. A new venture capable of capturing just a small percentage of the $700 million annual advertising budget would enjoy a sizable revenue stream.

VII) The health care industry enjoys an unusually high level of specialization and certification. The service can be designed to exploit this, thereby providing a robust system capable of matching professional experience to employer requirements and career objectives to employer opportunities.

An additional consideration is that the health care industry is under intense pressure to reform. Rapidly rising health costs have thrust the “health care crisis”
to center stage in the national debate and made “health care reform” the top priority in the Clinton administration’s first 100 days. In addition to this external pressure, hospitals face severe internal financial pressures. Margins are down to the point where patient revenues no longer cover operating expenses, forcing hospitals to turn to seminar tuition, parking fees, and gift shop sales to break even.

Payroll and benefits account for 55% of these operating expenses. These costs could be reduced if a more efficient, less costly means could be found to fill hospitals’ demands for health care professionals. An AHA study sums up the situation and concurs in the need for change:

“Hospitals will face significant challenges related to recruiting, retaining, and managing their human resources in the 1990’s... The demand for nursing personnel will outstrip supply by an increasingly wide margin...Shortfalls of allied health personnel will soon begin to seriously impede health care delivery if solutions are not found...Hospitals will need to implement innovative recruitment and retention strategies...” [AHA, 1992, p. 31] [Emphasis added]

Hospitals are highly motivated to change the status quo in the health care recruitment industry. Professionals also express dissatisfaction with the timeliness and completeness of the current employment information distribution system.

This evaluation leads one to conclude that an electronic market would be welcomed by both recruiters and professionals, provided that it was easy to interact with and required no special equipment to use. A new business venture stands a good chance of success if it can meet these requirements efficiently and deal with the threat of entry posed by the publishing industry. Health care
recruitment appears to be an excellent opportunity for an electronic information service. One possible design for such a service is described in the next section.

Chapter 8: The MediMatch Health Care Job Information Bank

A prototypical electronic information service has been designed which meets the needs of the health care recruiting industry. Called the MediMatch Health Care Job Information Bank, it is designed to collect and distribute information on health care professionals, employers, and specific job opportunities. The service is able to match medical personnel to medical job openings on a national basis.

Product Design

The MediMatch service is a computer-based marketing information service. At the heart of MediMatch are three databases: a Professionals database, an Employers database, and a Job Openings database.

The Professionals database contains a highly structured resume which describes the professional’s experience, education and career objectives. A pre-specified vocabulary is used to standardize the descriptions of key search fields, like specialty and certification (see Appendices 1 and 2). Employers will be able to search this database by the predefined fields of the resume. This capability is sufficient to support supplier screening, and so establish a partial electronic market.

A future extension to the database might be a free-text resume, solicited from the professional and stored in the database. Employers could search the full text for any combination of words or phrases that they feel will identify the perfect candidate for their position. One could even envision adding a multimedia presentation in which the professional described themselves and their career
objectives. This capability would enable the service to go beyond supplier screening and begin to approach a pure electronic market.

All participating Registered Nurses and Allied Health Professionals would provide essential data about themselves: contact information, experience and career objectives, if known. This data would be collected by phone and verified with a hard copy mailed to the professional. Optional data, further describing the professional’s experience, can be accommodated by the database; professionals add optional data to the hard copy of their record and return it to MediMatch for inclusion in the database. A privacy option allows the professional to prevent release of any information that would uniquely identify them; employers attracted by the specialty, experience, or objectives of these anonymous professionals could contact them via the MediMatch office.

The Employers database contains information describing the employer (typically a hospital) and its surrounding community. Registered employers provide a comprehensive profile of their institution, using a highly structured format to facilitate searching and comparison. In addition to generic data, like number of beds or areas of specialties, hospitals will provide data about the terms and conditions of employment of RNs and AHIs.

The final element is the Jobs database. In this database, registered employers list the job openings for RNs and AHPs at their institutions. Specific data on the opening—items important to the professionals—are listed along with the title and specialty. Hospitals list or update openings by mail, fax phone or e-mail.
Product Benefits: Professionals

Salary and Benefits Check-Ups

Many individuals will use the service to perform a salary and benefits check-up, comparing their current employment situation to those offered by other hospitals in their immediate area. This can be done in complete privacy, thanks to the anonymity provided by the “private” resume option.

One-Stop Employment Information

The MediMatch service provides comprehensive, comparative and selective information about employment opportunities, information not now available from any source. Professionals looking to relocate can gather information on their target community with a single search, in sharp contrast to the numerous calls required today. Those looking to make a career move, but without a clearly targeted geographical area, can search for institutions meeting their unique requirements, an impossible task in the current marketplace. Finally, professionals can register their interest in specific types of jobs and be alerted when those jobs are posted to the database.

Resume Distribution

Professionals can distribute their education, work experience and career objectives to any registered employer that matches their search criteria.

Product Benefits: Employers

Nation-wide job advertising

By entering a job opening into the MediMatch system, the employer gets nation-wide exposure to the professional labor market. Whenever an RN or AHP
searches the Employers or Job Openings database, all registered employers are equally accessible—the system is completely unbiased.

*Automatic Fulfillment and Resume Referral*

Whenever a professional searches the Employers or Job Openings database and matches a subscribing employer’s profile or job listing, the professional’s profile is screened against the hospital’s “send” profile. MediMatch forwards the hospital’s recruitment literature to professional that pass the screen within 24 hours. The professional’s resume (or in the case of “private” resumes, the non-identifying profile and professional ID number) is sent via fax, mail, or e-mail to the hospital within 24 hours.

In focus groups and interviews, recruiters have placed particular value on this portion of the service. First, 24 hour fulfillment compares very favorably with the time it takes to receive and process leads from reader response (“bingo”) cards or existing marketing information services. Second, shifting fulfillment to a service bureau relieves recruiters of a much clerical work, and allows them to focus on more value-added functions of needs assessment, interviewing and retention planning. Third, the information collected from the professional allows pre-qualification and targeted fulfillment—MediMatch can send the hospital’s $1 brochure to staff nurses, and the $20 video to Certified Registered Nurse Anesthetists.

*Candidate Searches*

Employers can search the database to identify candidates for specific openings. Subscribers can search on demand, or they may post a standing order for professionals that match their recruitment profile. Search requests are made by
phone, fax, e-mail or mail. Trained searchers query the Professionals database; search results are delivered to employers via mail, fax, or e-mail, as the subscriber wishes. Unlike list rental services, these names would be owned by the hospital and may be solicited repeatedly. Professionals who choose to anonymity are reachable through MediMatch’s forwarding service. No other service provides pin-point marketing to these privacy-conscious individuals.

Product Life Cycle

The initial product offering would allow hospitals and professionals to contact MediMatch by phone, fax, or mail or e-mail (using a commercial e-mail system). This is done both to simplify the initial system design and to minimize the barriers to acceptance.

In the future, the system could be extended to provide direct online access for customers. The major inhibitor to the addition of this enhancement to the service is the restraints on capital budgets placed by hospitals on recruiter expenditures. Another inhibitor is the lack of computer literacy of the recruiter population. A final restraint to be overcome is the privacy consciousness of professionals—security must be strengthened before employers are allowed direct access to the Professionals database.

An adjunct or replacement for this product would be CD distribution of the Professional database. This database might include a short multimedia presentation by the professional. Further penetration of PCs and CD-ROM into hospital recruiting offices will be required before this can be considered; the service could hasten this by providing CD-ROM drives to subscribers as part of this expanded level of service. There are also EEO and ADA (Americans with Disabilities Act) legal and regulatory considerations which must be resolved.
before this expanded service could be offered—since multimedia presentations by the professionals would convey information on their race, ethnic background and physical status, it opens recruiters to the charge of using this information to discriminate against certain protected groups.

Further down the road, when professionals have access to multi-media terminals and high-bandwidth communications (B-ISDN or interactive CATV), the service can be expanded to provide video and audio distribution of subscribing hospitals' “ads” from the Employers database to the professionals' home.

**Competitor Analysis**

Employment agencies have partially fulfilled the brokerage role in the health care recruitment industry. These agencies represent only a few employers and/or professionals at any one time and there is no evidence to suggest that any of these agencies retains data about the professionals they place. These agencies will probably assume the new role of expert searchers and act as agents, mediating between their clients and the MediMatch system, for those professionals or institutions that require this level of consultation and assistance.

In recent years, a few referral services have used information technology in health care recruiting. Several professional associations have sponsored recruitment systems as a service to their members. The Healthcare Financial Management Association commissioned the Exec-u-Trak Career Network, a resume referral service for its 28,000 members. [Nemes, 1990] The American Organization of Nurse Executives (AONE) is building a similar system to assist vice-presidents and directors of nursing with their careers.
The American Nurses Association offers RNs a resume referral service via its Nurse Placement Center. A highly structured resume form is completed and sent to an employment agency, Roth Young St. Louis, where it is entered into the ANA resume database. All resumes are coded for anonymity. [The American Nurse, 1992] Primary research reveals that the database is not searchable. Rather, the database is published and distributed to subscribing employers as the Monthly Register. Hospitals are charged $675 a year for this service. Privately, recruiters express dissatisfaction with the product, since searching the printed output is tedious and error-prone. Still, 70 institutions subscribe to the service, which contains about 1,500 professional resumes at any one time.

Two independent services have targeted relocating nurses and offered them referrals to subscribing hospitals in distant cities. Competitive intelligence reveals that these services offer only hospital profile data, not job opening information, to professionals, and name referral, not resume information, to institutions. Furthermore, they do not retain data about professionals who have used the service. One of them, StatMatch, ceased operations in 1992. StatMatch had been charging hospitals between $2200 and $3500 annually for database searches of professional resumes.

The other independent service, NurseNet Plus, claims to have 100 subscribers at an annual subscription price of about $4,000. NurseNet limits its client base to a single hospital in a given market (a biased market, reminiscent of the Bankers Executive Network). NurseNet Plus targets relocating professionals through ads in professional and specialty journals. Professionals who call NurseNet Plus must give their name and address, specialty, geographic preference, and relocation date to NurseNet. They receive a profile of the NurseNet Plus subscriber(s) in the locale(s) in which they have expressed interest. Professional
resumes are not stored for future searches. Service design limitations and a “cream skimming” pricing strategy seem responsible for NurseNet Plus’ low level of market penetration.

A former competitor was the PERX system, founded several years ago by a physician in Boulder, Colorado. PERX sought to place computer terminals in nursing schools and recruiter offices. Nursing students would be led through a series of questions, in a career guidance session, with the result being a list of job opportunities. Recruiters were required to post all their openings to provide the system with the data it required to perform its career guidance function. Recruiters found this to be an onerous task. (Note that this requirement is a violation of Anderson’s second critical success factor—do not alter the roles of current market participants.) Further, recruiters reported receiving few leads through the system, and those leads were inexperienced nursing school graduates, not the specialists most in demand. Finally, the cost of the computer and network equipment proved to be a barrier to acceptance at many hospitals, which will spend millions on CAT scanners, or mainframe billing systems, but refuse requests for a PC in a recruiter’s office. PERX has since disappeared from the scene.

Publishers are the most dangerous potential competitors. Interviews with publishers reveal that they have done extensive research on electronic versions of their journals, but found that the rate of PC penetration among their readership is too low to warrant further development. Thus, the publishers’ perspective on information technology is as a distribution medium for the editorial content of their journals. No one appears to have considered IT as a replacement for the advertising content of their publication. Should a new venture attempt to establish such a service, it could expect a delayed, but strong, response from the
publishers. A penetration strategy is called for to rapidly establish MediMatch as the electronic market for the health care recruiting industry.

Marketing Plan

MediMatch's marketing strategy must be designed to respond to the critical success factors proposed in this thesis. An overall marketing plan for the service would contain the following points:

- MediMatch is an Information Service company providing an electronic job marketplace for Registered Nurses and Allied Health Professionals, and their employers.

- MediMatch uses structured resumes, profiles and job listings to match professional experience to employer requirements and career objectives to employer opportunities.

- MediMatch is designed to be easy to use. No specialized hardware, software, or training is required for professionals or employers to participate in the electronic market.

- MediMatch attracts RNs and AHPs to the service by a combination of direct mail, space advertising, and one-on-one sales at professional conferences, job fairs, and conventions.

- To encourage RNs and AHPs to use the service, MediMatch is offered free of charge to the professionals. The only requirement is that the professionals provide the minimum required resume data for inclusion in the Professionals database.
• MediMatch is designed so that participation by professionals is “risk-free”: participation can be suspended at any time and privacy safeguards are built into the Professional database.

• To solicit employers to subscribe to the service, MediMatch uses a mix of direct marketing techniques (e.g., direct mail, telemarketing, one-on-one sales presentations at customer sites and at conferences).

• MediMatch is offered to hospitals on a one-year subscription basis. Fees are on a sliding scale, based on hospital size and number of services purchased. The minimum service bundle is priced at a point designed to achieve rapid market penetration.

• To prove the value of the service in the start-up phase, MediMatch may offer free trial subscriptions to employers. Money-back guarantees are used to reduce the risk of subscription.

• MediMatch actively recruits professional organizations and other industry opinion leaders, seeking endorsements and assistance in educating professionals and employers of the benefits of the electronic recruiting market.

Financing Plan

By structuring the MediMatch service as a subscription product, the business avoids the expense of tracking and billing on a usage sensitive basis. An even greater advantage is that subscriptions are paid up front, then service is delivered through the year. As such, MediMatch generates positive cash flows early in its life as a new business. This not only reduces the need for start-up
capital but also shortens the length of time until investors can expect to cash out their investment.

Chapter 9: Conclusions

This study began with a review of the theory behind electronic markets and the factors critical to their success. A review of electronic recruitment services leave no doubt that many entrepreneurs—and larger established firms—believe that personnel placement is an excellent application for an electronic market. Still, many of these ventures have failed, and additional critical success factors, particular to the employment market, were proposed:

I) The service must be able to utilize a pull strategy, bypassing existing brokerages until critical mass is achieved with end users.

II) The end-user’s acquisition costs (including hardware, software and training) must be kept low.

III) The service must be priced to rapidly penetrate the market, thereby achieving a critical mass and capturing a first mover’s advantage.

IV) Support from a professional association is invaluable in achieving credibility and changing traditional job-hunting techniques in an industry.

V) The service must protect professionals’ confidentiality, especially if non-job-seeking professionals are expected to use the service.

VI) The service should be tightly focused on niche in the labor market where recruitment is a major issue, and a major expense, for employers.
VII) Industries with highly specialized job functions and a high level of certification improve the viability of the service by reducing product description complexity.

The supply of and demand for health care professionals was described and current recruiting practices analyzed. The industry was assessed using Malone, Yates and Benjamin’s framework, Anderson’s critical success factors, and the industry specific factors suggested by this research. These tests lead one to conclude that a limited electronic recruitment market (capable of supporting supplier narrowing) for health care professionals is feasible. Additional evidence suggests that such a service would be found desirable by both professionals and recruiters.

Finally, a prototypical system was described which serves the needs of the industry participants. Called the MediMatch Health Care Job Information Bank, the system used databases containing professionals’ resumes, employers’ profiles, and job opportunity listings. The service was designed, packaged and priced in accordance with the prescriptions of the critical success factors suggested by the research. Such a service appears to be capable of displacing weaker competing systems and achieving critical mass rapidly enough to forestall entry by the health care publishing industry.

Research and analysis lead to the conclusion that the MediMatch service is feasible. The next step for an entrepreneur considering such a venture would be to test the service concept, design and pricing in a series of focus groups and in a statistically valid survey of the market.
Appendix 1: RN Specialties and Certifications

Specialties (RNs)

Critical Care
CC - Coronary Care / CCU
CC - Emergency Department
CC - Flight Transport - Adult
CC - Flight Transport - Neonatal
CC - Ground Transport - Adult
CC - Ground Transport - Neonatal
CC - Intensive Care / ICU - Adult
CC - Intensive Care / ICU - Child
  ICU - Burn
  ICU - Cardiovascular
  ICU - Medical
  ICU - Med / Surg
  ICU - Neuro
  ICU - Pediatric
  ICU - Post-Anesthesia Recovery
  ICU - Surgical
  ICU - Transplant
CC - Intermediate Care
  Intermed - Medical
  Intermed - Med / Surg
  Intermed - Surgical
  Intermed - Telemetry
CC - Trauma Services
  Trauma - Level I
  Trauma - Level II
  Trauma - Level III
CC - Newborn Nursery (NICU)
  NICU - Level I
  NICU - Level II
  NICU - Level III

Psych / Mental Health
Psych - Adolescent
Psych - Alzheimer's Patient Care
Psych - Battered Women
Psych - Behavioral Disorders
Psych - Chemical Dependency
Psych - Child
Psych - Chronic Mental Illness
Psych - Co-Dependency
Psych - Consultation
Psych - Crisis Intervention
Psych - Depression Disorders
Psych - Developmental Disabilities
Psych - Eating Disorders
Psych - Family Counseling
Psych - General Psych
Psych - Gerontological
Psych - Intensive Care
Psych - Neuroscience
Psych - Suicide Intervention
Psych - Stress Management
Medical - Adult
Medical - Child
  Med - Allergy / Immunology
  Med - Cardiac Rehabilitation
  Med - Cardiovascular
  Med - Gastroenterology
  Med - Hematology
  Med - Immune Disorders / AIDS
  Med - Infectious Diseases
  Med - Metabolic Disorders
  Med - Nephrology
    Nephrology - Dialysis
  Med - Neurology
  Med - Oncology
    Oncology - Chemotherapy
  Med - Pulmonary
  Med - Rehabilitation
  Med - Rheumatology
Surgical - Adult
Surgical - Child
  Surg - Burn
  Surg - Cardiac
  Surg - Cardiovascular
  Surg - Ear, Nose, Throat
  Surg - Gastroenterology
  Surg - Gynecology
  Surg - Neurosurgical
  Surg - Ophthalmology
  Surg - Orthopedics
  Surg - Plastic Surgery
  Surg - Thoracic
  Surg - Transplant
    Transplant - Bone Marrow
    Transplant - Cardiac
    Transplant - Cardiopulmonary
    Transplant - Liver / Pancreas
Transplant - Renal
Surg - Urology
Operating Room
  OR - Ambulatory Surgery
  OR - Anesthetist
  OR - Cardiac
  OR - Ear, Nose, Throat
  OR - General Surgery
  OR - Neurosurgery
  OR - OB/GYN
  OR - Ophthalmology
  OR - Oral Surgery
  OR - Orthopedics
  OR - Pediatrics
  OR - Plastic Surgery
  OR - Pre-Op Holding
  OR - Transplant
  OR - Trauma
  OR - Urology
  OR - Vascular Surgery
OB/GYN
  OB/GYN - Ante-Partum Care
  OB/GYN - High-Risk Ante-Partum
  OB/GYN - Fertility Problems
  OB/GYN - Gynecology
  OB/GYN - Labor and Delivery
  OB/GYN - Maternal / Child
  OB/GYN - Midwifery
  OB/GYN - Neonatal
  OB/GYN - Newborn
  OB/GYN - Pre-Natal Care
  OB/GYN - Post-Partum Care
  OB/GYN - Women's Health
Gerontology
  Geront - Skilled
  Geront - Long Term Care
Community Health
  ComHlth - Correctional Facility
  ComHlth - College
  ComHlth - Home Health Care
  ComHlth - Public Health
  ComHlth - School
Special Procedures
  SpclProc - Angioplasty
  SpclProc - Cardiac Cath Lab
  SpclProc - Diagnostic Radiology
SpclProc - Endoscopy
SpclProc - Interventional Radiology

Other Nursing Areas
Other - Admissions
Other - Care Review
Other - Claims Review
Other - Consultation
Other - Discharge Planning
Other - Enterostomal Therapy
Other - Family Nursing
Other - Health Plans / HMO
Other - Health Policy
Other - Infection Control
Other - Intravenous Therapy
Other - Law
Other - Nurse Practitioner
Other - Nurse Recruitment
Other - Nutritional Support
Other - Occupational Health
Other - Quality Assurance
Other - Research
Other - Risk Management
Other - Sales / Marketing
Other - Utilization Review
Other - __________

Education / Faculty
Ed - ACLS Instructor
Ed - ACLS Trainer
Ed - BCLS Instructor
Ed - BCLS Trainer
Ed - Community Education
Ed - Cont'g Educ Inst'r/Prof (JC)
Ed - Cont'g Educ Inst'r/Prof (Univ)
Ed - Critical Care Educator
Ed - Director-Nursing Educ Dept
Ed - Faculty
Fac - Degree Program
Fac - BSN Program
Fac - MSN Program
Fac - PhD Program
Field - Admissions
Field - Counseling Activities
Field - Curriculum Design/Devel
Field - Guest Lecturer
Field - Nursing (General)
Field - OR Nursing
Field - Patient Education
Field - Pediatric Nursing
Field - Psych Nursing
Field - Surgical Nursing

Staff Development
StfDev - Acute Care Systems
StfDev - Long Term Care Systems

Administrative Management
Admin - Acute Care Systems
Admin - Clinic
Admin - Home Health Systems
Admin - Long Term Care Systems
Admin - Public Health Systems
Admin - School of Nursing

First Line Management
1st Line - Acute Care Systems
1st Line - Clinic
1st Line - Home Health Systems
1st Line - Long Term Care Systems
1st Line - Public Health Systems
1st Line - School of Nursing

Association / Public Administration
Assoc/PA - Nursing Association
Assoc/PA - State Board of Nursing

Committee Member
Comm - Academic Senate
Comm - Ad Hoc
Comm - Care Planning
Comm - Curriculum
Comm - Ethics
Comm - Faculty Affairs
Comm - Infection Control
Comm - Interdisciplinary
Comm - Medical Records
Comm - Nurse Practice
Comm - Product Evaluation
Comm - Quality Assurance
Comm - Recruitment & Retention
Comm - Research
Comm - Risk Management
Comm - Safety
Comm - Student Affairs
Comm - Utilization Review
Certifications (RNs)
Adult Nurse Practitioner
Clinical Specialist in Adult Psychiatric and Mental Health Nursing
Clinical Specialist in Child & Adolescent Psychiatric and Mental Health Nursing
Clinical Specialist in Community Health Nursing
Clinical Specialist in Gerontological Nursing
Clinical Specialist in Medical-Surgical Nursing
College Health Nurse
Community Health Nurse
Critical Care Nurse - CCRN
Emergency Nursing - CEN
Enterostomal Therapy Nurse - CETN
Family Nurse Practitioner
General Nursing Practice
Gerontological Nurse
Gerontological Nurse Practitioner
Hemodialysis Nursing - CHN
Inpatient Obstetric Nurse - RNC
Intravenous Nurses - CRNI
Low-Risk Neonatal Nurse - RNC
Medical-Surgical Nurse
Neonatal Intensive Care Nurse - RNC
Neonatal Nurse Clinician/Practitioner - NC
Nurse Anesthetist - CRNA
Nurse-Midwives - CNM
Nursing Administration
Nursing Administration, Advanced
Nursing Continuing Education/Staff Development
Ob/Gyn Nurse Practitioner - RNC
Oncology Nurse - OCN
Orthopaedic Nurse - ONC
Pediatric Nurse
Pediatric Nurse Practitioner
Perinatal Nurse
Perioperative Nurse - CNOR
Peritoneal Dialysis Nurse - CPDN
Rehabilitation Registered Nurse - CRRN
Reproductive Endocrinology/Infertility Nurse - RNC
School Nurse
School Nurse Practitioner
Certifying Agencies (RNs)
American Association for Critical Care Nurses (AACN)
American Association for Medical Transcription (AAMT)
American Board for Certification in Orthotics and Prosthetics (ABCOP)
American Board of Bioanalysis (ABB)
American Board of Cardiovascular Perfusion
American Board of Registration of EEG Technologists (ABRET)
American College of Nurse - Midwives (ACNM)
American Medical Records Association (AMRA)
American Nurses Credentialing Center (ANCC)
American Occupational Therapy Certification Board (AOTCB)
American Registry of Clinical Radiography Technologists (ARCRT)
American Registry of Diagnostic Medical Sonographers (ARDMS)
American Speech - Language - Hearing Assoc. (ASHE)
Board of Certification for Emergency Nursing (BCEN)
Board of Nephrology Examiners - Nursing and Technology (BNE - NT)
Cardiovascular Credentialing Intl. (CCI)
Certification Board of Infection Control (CBIC)
Certifying Board for Dietary Managers (CBDM)
Commission on Dietetic Registration (CDR)
Council on Certification of Nurse Anesthetists (CCNA)
Credentialing Commission of Intl. Society for Clinical Laboratory Tech (ISCLT)
Enterostomal Therapy Nursing Certification Board (ETNCB)
Intl. Assoc. of Hospital Central Services Management (IAHCSM)
Intravenous Nurses Society Certification Corporation (INSCC)
Liaison Council on Certification for the Surgical Technologist (LCCST)
National Certification Agency (NCA) for Medical Laboratory Personnel
National Certification Board: Perioperative Nursing (NCB / PN)
National Commission on Certification for Physician Assistants (NCCPA)
National Council for Therapeutic Recreation Certification (NCTRC)
National Foundation for Non - Invasive Diagnostics (NFND)
Natl. Assoc. of Health Unit Coordinators Certification Board (NAHUC)
Natl. Assoc. of Orthopedic Technologists (NAOT)
Natl. Assoc. of Social Workers (NASW)
Natl. Board for Respiratory Care
Natl. Commission for Healthcare Education. Credentialing, Inc. (NCHEC)
Natl. Registry in Clinical Chemistry (NRCC)
Natl. Registry of Emergency Medical Technicians (NREMT)
Nuclear Medicine Technology Certification Board (NMTCB)
Nurses Assn. of American College of Obstetricians & Gynecologists (NAACOG)
Oncology Nursing Certification Corporation (ONCC)
Orthopaedic Nurses Certification Board (ONCB)
Quality Assurance Certification Board (QACB)
Rehabilitation Nursing Certification Board (RNCC)
Appendix 2: AHP Certifications

Certifications (AHPs)
Clinical Perfusionist / CCP
Certified Cardiographic Technologist / CCT
Registered Cardiovascular Technician / RCVT
Certified Cardiovascular Technician / CCVT
Certified Registered Central Services Technician / CRCST
Certificate in Central Service Management Concepts / CCSMC
Clinical Chemist / CC
Clinical Chemistry Technologist / CCT
Toxicological Chemist / CT
Certified Dietary Manager / CDM
Registered Dietitian / RD
Dietetic Technician Registered / DTR
Registered EEG Technician / REEGT
Registered Evoked Potential Technician / REPT
Emergency Medical Technician - Basic / NREMT - Basic
Emergency Medical Technician - Intermediate / NREMT - Intermed
Emergency Medical Technician - Paramedic / NREMT - Paramedic
Health Education Specialist / CHES
Certif. Infection Control / CIC
Director / BCLD, CLD, BLD
Manager / BLM
Supervisor / BLS
Medical Technologist / RMT
Laboratory Technician / RLT
Physician Office Laboratory Technician / POLT
Clinical Laboratory Scientist / CLS
Clinical Laboratory Technician / CLT
Clinical Laboratory Phlebotomy / CLP
Clinical Laboratory Cytogenetics / CSC
Medical Record Administrator / RRA
Medical Record Technician / ART
Hemodialysis Technician / CHT
Occupational Therapist, Registered / OTR
Certified Occupational Therapy Asst. / COTA
Orthopedic Technologist / COT
Prosthetist Practitioner / CP
Orthotist Practitioner / OP
Pharmacist
Pharmacy Asst.
Physician Assistant / PA - C
Certified Professional in Quality Assurance / CPQA
Radiography Technician / RT
Registered Diagnostic Medical Sonographer / RDMS
Registered Diagnostic Cardiac Sonographer / RDCS
Registered Vascular Technologist / RVT
Ultrasound / CET
Nuclear Medicine Technologist / CNMT
Certified Respiratory Therapy Technician / CRTT
Registered Respiratory Therapist / RRT
Certified Pulmonary Function Technician / CPFT
Perinatal / Pediatric Respiratory Care Practitioner
Certified Social Worker / CSW
Speech - Language Pathologist / CCC in Speech Lang.
Audiologist / CCC in Audiology
Surgical Technologist / CST
Therapeutic Recreation Specialist / CTRS
Provisional Therapeutic Recreation Specialist / Prov - CTRS
Therapeutic Recreation Assistant / CTRA
General and Specialty (Radiology) / CMT
Health Unit Coordinator / CHUC

Certifying Agencies (AHPs)
American Board of Cardiovascular Perfusion
Cardiovascular Credentialing Intl. (CCI)
Intl. Assoc. of Hospital Central Services Management (IAHCSM)
Natl. Registry in Clinical Chemistry (NRCC)
Certifying Board for Dietary Managers (CBDM)
Commission on Dietetic Registration (CDR)
Amer. Board of Registration of Electroencephalographic Technologists (ABRET)
Natl. Registry of Emergency Medical Technicians (NREMT)
Natl. Commission for Healthcare Education Credentialing, Inc. (NCHEC)
Certification Board of Infection Control (CBIC)
American Board of Bioanalysis (ABB)
Credentialing Commission of Intl. Society for Clinical Lab. Technology (ISCLT)
National Certification Agency (NCA) for Medical Laboratory Personnel
American Medical Records Association (AMRA)
Board of Nephrology Examiners- Nursing and Technology (BNE-NT)
American Occupational Therapy Certification Board (AOTCB)
Natl. Assoc. of Orthopaedic Technologists (NAOT)
Natl. Board for Certification of Orthopaedic Technologists
American Board for Certification in Orthotics and Prosthetics (ABCOP)
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