

Using Technology to Fight Insurance Fraud

Daniel Finnegan, Ph.D., and Joan Marsh

Insurance claim fraud is a big business in North America with annual estimates of fraudulent or exaggerated claims ranging anywhere from 10% to 20%—or higher.

Automated controls have successfully reduced fraud in other areas such as welfare fraud. There is no reason why the insurance industry should not experience similar success in its fight against fraud. The problem is solvable.

Automated information systems provide the insurance industry with a valuable tool in the fight against fraud. Automated fraud control systems play to the strengths of the insurance industry—the control of risk through the management of information.

An ever growing list of computerized applications and databases are being made available to SIUs to aid in detecting and deterring fraud. Quality Planning Corporation—a San Francisco consulting firm specializing in fraud control systems—recently completed two surveys of the state-of-the-art in computer assisted fraud control.

First, we surveyed SIUs to learn how they used emergent technology to detect and defeat claim fraud. We surveyed 175 SIU managers representing most major insurers in North America. Second, we contacted over 400 software and database vendors

selling products of potential use in fraud control.

We asked the participating SIU members to tell us what kind of computerized tools—if any—they were using in their claims investigations, how they used them, and how they rated their effectiveness. While the survey included all types of computerized investigation aids, our primary focus was in eight areas

1. *External databases accessing public records such as reverse phone directories, public filings, and motor vehicle registrations*
2. *Fraudulent ID tools*
3. *Medical bill review tools*
4. *Investigative-linking tools*

Daniel Finnegan, Ph.D., is President, and Joan Marsh a Senior Associate, of Quality Planning Corporation. Dr. Finnegan has over fifteen years of high-level professional experience in the design and implementation of fraud management systems and was an advisor on welfare fraud to the Federal Government and Office of the President during the Reagan administration. Marsh has extensive experience with financial operations and systems.

5. *Accident reconstruction tools*
6. *Mapping tools*
7. *Claim management tools*
8. *In-house developed systems*

SIU Software Usage

Of our respondents, over 90% reported using one or more software tool, with an average of 4.7 products used. The table below shows product type by relative usage.

Product Types	Usage (%)
External databases	40.7%
Fraudulent ID	25.0%
In house systems	11.1%
Medical Bill Review	5.6%
Other	4.6%
No designation	3.7%
Linking	2.8%
Accident reconstruction	2.8%
Mapping	1.9%
Claims Management	1.9%
Total	100.0%

External databases are the most common product used, with 41% of respondents using one or more external database. Twenty-five percent of our respondents reported using fraudulent ID check tools which were the second in popularity. Most of the computerized investigation tools used by

responding SIUs were obtained from outside sources—only 11% reported in-house systems.

A wide variety of vendors' products are in use without any clear-cut favorites. Of the over 100 products mentioned, the National Insurance Crime Bureau's online database systems were the most frequently cited, followed by CDB's Infotek and AISG's Index System and Property Insurance Loss Register.

Users gave high marks to products which featured extensive databases and quick response time. Concerns most often mentioned were product costs and database limitations such as infrequency of updates, incomplete data, and the fact that in some cases, the data is limited by what the subscribers report.

Product Summaries¹

External Databases

The most commonly used SIU computer tools are external databases which are accessed online. A constantly growing number of databases are available. Offerings vary greatly from state to state and from vendor to vendor. The list that follows is a good indicator of the variety of databases that are available.

¹ Please note that we have tested fewer than half of the products mentioned throughout this article. Our discussion of any given product does not constitute an endorsement of it, nor does it include any assessment of a product's effectiveness.

Examples of Databases Available for Searches

1. Address checks and history
2. Address validation
3. Airline ticket travel records (limited access)
4. Ancestry
5. Arrest warrants (limited access)
6. Asset searches
7. Auto accident records
8. Auto crash-worthiness by year, make and model
9. Bank asset searches
10. Bank account verifications
11. Bankruptcies
12. Birth records
13. Board of equalization records
14. Boat owners
15. Bodily injury insurance claims
16. Business credit information
17. Business history and public filings
18. Business ownership
19. Business subsidiaries
20. Child support filings
21. Civil action filings
22. Consumer credit (limited access)
23. Consumer purchasing patterns for over 90 million US families
24. Contractors' licenses
25. Corporate filings
26. Corporate officers and directors
27. Criminal case records and indexes
28. Death claim search
29. Divorce records
30. Employment history
31. Eviction records
32. FAA Aircraft Ownership
33. Federal district court records
34. Federal penitentiary records
35. Fictitious business name registers
36. Fraudulent insurance claim referrals
37. High school graduation listings
38. Homeowner's insurance claims
39. Incomplete license plate searches
40. Insurance codes by jurisdiction
41. International travel ticketing (limited access)
42. International skip tracing
43. Judgments
44. Jury verdicts
45. Lien listings
46. Limited partnership registers
47. Lottery winners
48. Magazine subscription lists
49. Mail order purchasing data by address
50. Marriage licenses
51. Medical licensing board sanctions
52. Medical licensing requirements and restrictions
53. Medical malpractice law suits
54. Medical professionals sanctioned by the Federal Government
55. Medical prescription and devices prices
56. Medical procedure and hospital costs by geographic area.
57. Memberships in numerous clubs and organizations.
58. Motor vehicle registrations
59. Motor vehicle violations
60. Moving index
61. Municipal court records
62. Name scans (by total name, surname, date of birth, and more)
63. National cemetery index
64. National consumer database
65. Nearby business neighbors
66. Neighborhood searches
67. OSHA inspections
68. Probate records
69. Professional degrees and organizations for many professions
70. Product warranty card lists
71. Property loss insurance claims
72. Publisher's mailing lists
73. Real property searches by county
74. Registered voter lists
75. Reverse telephone directories
76. Sales tax records
77. Social Security death records
78. Standard medical treatment patterns by diagnosis
79. State professional licensing agency lists (great variety from accountants to vocational nurses)
80. State prison records
81. State unemployment wage files (limited access)
82. State tax liens
83. Stocks and bonds holdings
84. Stolen vehicles
85. Storm and lightening data to verify weather damage claims
86. Superior court records
87. Trade marks
88. Truck driving history
89. Universal commercial code searches
90. University graduates by university, date of graduate and degree
91. US exits and reentry (limited access)
92. Vehicle title search
93. Vehicle license searches
94. Vehicle repair times and prices
95. Vehicle parts prices (new and used)
96. Vehicle salvage prices
97. Welfare program participation—Food Stamps, AFDC, Aid to Disabled. (Limited access)
98. Who's Who listings

- 99. Workers' compensation claims
- 100. Yellow page searches

Limiting the list to 100 was an arbitrary decision. Hundreds of more specialized databases are available for particular searches. New databases are being added at an ever increasing rate.

As impressive as this listing is, it only touches the surface. In the hands of a skilled database searcher, cross indexing multiple databases can produce a depth of information that has to be seen to be believed. For example, the MetroNet database links many consumer databases to produce a 163 million name online file.

Only a fraction of possible search sources are available from any one vendor. However, there are many search specialist firms and organizations which maintain access to all the major database resellers.

External database users who responded to our survey reported generally positive experiences. The primary advantages seen were speed of response and providing good leads. The primary disadvantages were high costs followed by gaps in information and out-of-date information.

Leading Vendors

NICB (National Insurance Crime Bureau) provides one of the strongest sets of online insurance claim data. They can be reached at 10330 S. Roberts Road, Palos Hills, IL 60465, (708) 430-5685, Ext. 498

AISG (American Insurance Services Group) offers The Index System for bodily injury claims and Property Insurance Loss Register for material damage claims. (Plans are in the works to integrate the INDEX and PILR databases). Contact AISG at 85 John Street, New York, NY 10038, (212) 669-0406

CDB Infotek sells the set of public record databases most commonly used by insurance investigators. Contact them at Six

Hutton Centre Drive, Santa Ana, CA 92707, (800) 427-3747

Metromail through *MetroNet On-Line* provides direct access to the largest consumer information database. This resource has been underutilized by the insurance industry. Contact them at 1 East 22nd Street, 5th Floor, Lombard, IL, (800) 927-2238

US Datalink accesses over 250 public information sources. Their address is 671 Bayway Drive, Baytown, TX 77520, (713) 424-7223

Ferrari, 8 Tudor Court, Getzville, NY 14068, (716) 689-6577, has one of the most comprehensive sets of international database searches for 280 foreign countries; however, they are reluctant to answer inquiries.

Fraudulent ID Checks

Software that checks for fraudulent IDs helps establish the creditability of claimants and the documentation they present in support of insurance claims. For example, ID checks can decode a VIN (vehicle identification number) to determine whether such a vehicle exists and whether the VIN is consistent with the vehicle which was presented.

Social Security Numbers can be decoded to determine when and where the number was issued, and whether the number has been retired (i.e., the holder is deceased). In some jurisdictions, decoding driver's licenses will reveal a variety of information such as date of issue, and the holder's birth date and sex. Credit card numbers can be decoded to verify whether or not they are legitimate.

Users of these services reported they found them valuable, fast, and relatively inexpensive.

Leading Vendors

VINassist provided online by NICB decodes VIN's to vehicle manufacturer, model, model year, engine size, and restraint system. Contact NICB, 10330 S. Roberts Road, Palos Hills, IL 60465, (708) 430-5685

PC VIS is a PC based VIN decoder provided by Polk, 400 Pike St. Cincinnati, OH 45202, (513) 381-3885

The Social Security Administration provides online data to aid in decoding Social Security Numbers. Contact their Employer Information Bulletin Board at (410) 965-1133. Communication software settings are: no parity, 8 data bits, 1 stop bit, full duplex, XMODEM protocol and ANSI terminal. (Not to worry—your local computer person will know what all that means.)

Task Force Software provides two stand alone PC products—*SSN*, a Social Security Number decoder, and *USDL*, a driver's license and credit card decoder. Contact Task Force Software, 5247 Miller Ave. Klamath Falls OR 97603, (503) 883-2434

There are a variety of low cost programs which can verify whether or not a reported address is valid. An example is *Select Street* produced by ProCD, 222 Rosewood Drive, Danvers, MA 01923, (800) 992-3766

In addition to the above, a variety of ID checks are included by most of the public database resellers listed earlier.

Medical Bill Review Tools

We are completing a comprehensive study of the ways automated medical bill and record review systems are used in cost and fraud control. These systems offer a wide range of features such as

1. *Matching billed procedures to diagnostic codes to determine reasonableness—for example, billing for a neck sprain after diagnosing minor scratches on the arm.*
2. *Checking for upcoding when billing procedures—i.e., charging for a more complex procedure than actually performed.*
3. *Checking for “unbundling” procedure charges which increase the total bill—i.e., charging separately for each individual element of a procedure rather than the procedure as a whole.*
4. *Checking for unlicensed types of care such as a chiropractor performing surgery.*
5. *Checking licenses of medical professionals to ensure they are current and whether or not medical sanctions are in place.*
6. *Checking for double billing—submitting the same bill twice or charging for removing two appendices.*
7. *Providing expert system reviews of questionable treatment patterns such as performing a hysterectomy on a male.*
8. *Conducting utilization reviews which compares the level of treatment for a given patient to norms for similar diagnostics.*
9. *Checking across patients to identify medical professionals who uniformly overtreat—for example, chiropractors whose entire caseload require dozens of treatments to get better.*
10. *Completing checks across patients for identical billings, medical reports, and treatment patterns—i.e., identifying mass produced medical reports which do not reflect individual treatments.*
11. *Checking for treatments on holidays or weekends when the clinic is not open.*
12. *Checking for misuse of expensive diagnostics.*

13. *Flagging cosmetic procedures.*
14. *Flagging obsolete or experimental procedures.*
15. *Flagging nonexistent procedures and diagnostic codes.*
16. *Comparing billed rates for medical procedures to allowable schedule of rates.*
17. *Flagging misuse of consultations.*
18. *Scheduling lookups for overbilling for drugs and medical devices.*
19. *Completing an analysis of average settlement values and treatment costs for similar injuries among similar individuals.*

No single automated medical bill review system offers all—or even a majority—of these features.

Our survey respondents reported automated medical bill review systems tended to be more useful in handling routine claim exaggeration than in investigating hard core fraud. One respondent reported that their in-house system produced savings of two million per month.

Quality Planning is in the process of completing a larger study concentrating specifically on automated medical bill review systems. Results of this study should be available in several months.

Leading Vendors

GMIS provides one of the most sophisticated artificial intelligence analysis systems in literally millions of rules. 5 Country View Road, Malvern PA 19335, (610) 296-3838

Medata produces an easy to use, PC based medical bill review system, 801 North Parkcenter Drive, Santa Ana CA 92705, (714) 953-1770

ADP National BioSystems created *Provider Bill Audit (PBA)*, a fee review and utilization review system running on an OS/2 platform. 11200 Rockville Pike, Suite 300, Rockville, MD 20852

Investigative Linking Tools

Beyond tying individuals together, most linking software can make a variety of connections including events and activities, locations, telephone numbers, financial transactions, insurance claims, motor vehicles, organizations, and so on.

Linking software uses graphic forms to display complex connections and promote understanding them. NETMAP software, for example, can display data in a variety of views to show the connections of any given individual or organization or provide an overview of a network of related individuals and organizations.

Only a distinct minority of SIUs employ linking software. The primary successes we have observed have been with insurers who have a significant market share in a particular geographic region. To discern patterns of fraud, it possible to use linking software only when there is a large number of repeat claims involving the same players.

However, when this condition is met, we have seen linking technology produce very strong results with major savings.

Leading Vendors

ORION Scientific Systems produces ORIONLEADS for UNIX systems and WINLEADS for PC systems. Contact them at 19800 MacArthur Blvd, Suite 480 Irvine, CA 92612, (714) 261-0226.

NETMAP is produced by ALTA Analytics, 555 Metro Place North, Suite 175, Dublin, OH 43017, (614) 792-2222

WATSON is produced by Harlequin, One Cambridge Center, Cambridge, MA 02142, (617) 374-2400

Accident Reconstruction Tools

Automobile accident reconstruction software provides a dramatic way to defeat questionable claims. Sophisticated software exists that will demonstrate that the physical evidence is inconsistent with the reported facts of an accident.

The Professional Development Division of SAE International (Society of Automotive Engineers) provides LARM2, accident reconstruction software which runs on a standard PC or laptop computer. SAE also holds periodic conferences on the topic and is a good source of up-to-date information on the subject. Contact them at 400 Commonwealth Drive, Warrendale, PA 15096, (412) 772-7148.

Mapping Software

Mapping software reveals potential patterns of fraudulent activities through plotting data on individual claims and groups of claims on maps. Mapping claims can reveal many inconsistencies that might prompt further investigation.

Like linking software, mapping software provides a means to uncover hidden connections through graphic display. For example, one might be suspicious of an auto claim where the insured and all claimants were found to live within a block of each other but the accident occurred some distance away. Or, perhaps a claimant travels ten miles or more every day for treatments with a chiropractor whose office is next door to the claimant's attorney.

Leading Vendors

MapInfo is produced by MapInfo Corporation, One Global View, Troy, NY 12180 (800) 327-8627

Atlas GIS is owned by ESRI, Inc. Call 1-800-447-9778 for product information.

ArcView is produced by ESRI, Inc., 380 New York Street, Redlands, CA 92373 (909) 793-2853

These products allow integration with existing databases, programming of standard reports and investigation methods, and linking to other software. As a result, at least in the setup stage, they also require some significant programming support. Other less sophisticated mapping products, such as *SelectStreet*, can be found in local software stores.

Claims Management Tools

A variety of law enforcement and litigation case management software has been adapted for use in insurance claim handling. In addition, several companies have developed claims management software specifically designed to meet the needs of investigating questionable claims. These systems go beyond standard claim handling software by providing superior methods for tracking individuals and organizations across claims.

For example, a proprietary system we are designing for Qestrel Claims Management will automatically check all identifiers associated with new claims, such as name, SSN, driver's license, address, and so on to determine whether Qestrel has seen this identifier before, and if so, whether it was associated with any questionable activities. The Qestrel system will furnish superior data navigation tools permitting investigators to identify all the links between parties participating in current and past claims.

Survey respondents reported that their capacity, or incapacity to identify prior claims, claimants, doctors and so on in their systems was a primary determinate of their ability to fight systematic fraud.

Leading Vendors

Modulaw, is an integrated investigative system produced by Inslaw 1125 15th Street NW, Suite 301, Washington, DC 20005, (202) 828-8600

The *Qestrel* system is proprietary. However, information on Qestrel can be obtained through Qestrel Claim Management, Inc., 6601 Center Drive West, Suite 500, Los Angeles, CA 90045, (310) 348-8114

Internet Resources for Insurance Investigators

The Internet is changing with such rapidity that it is hard to keep up. To date, we have seen very little available which was not available through database vendors, usually at much lower cost.

The Internet includes resources for those on both sides of the fraud game. *NetSpy*—a Michael Wolff Book, published by Wolff New Media LLC, New York, 1996—is an excellent reference on using the Internet and online services for investigations. Two interesting sites are

<http://www.britnet.co.uk./scope/intro.html> for those interested in international money laundering and tax evasion.

<http://www.electriciti.com/~ipgbooks/index.html> for those interested in fake ID's, credit card fraud, and links to hacker sites.

Also interesting are Internet resources used by related investigators, such as

<http://www.loyola.edu/dept/polysci/html/intel.html>, and

<http://www.tscm.com/intelsites.html> provide sources used by the intelligence community. Links quickly lead to sources for wire-tapping, B&E, surveillance, and many other wonderful things.

<Http://www.nando.net/prof/poynter/cardirec.html> lists sources used by reporters for investigations.

The Internet is changing very rapidly, but the above sites should give you a good start.

In-House Data Systems

We have reviewed over thirty in-house insurance claim systems. All have significant difficulties tracking information on parties who are involved in a given claim other than the insured. Most systems cannot tell if they have seen the same claimant before, if a particular attorney has been involved on other claims, the number of claims which share a certain address, etc.

The fact that name and address fields—among others—are free-form is generally at the root of the problem. Highly standardized data entry conventions are necessary to conduct searches for matches. Names in particular are subject to this problem due to inconsistencies in entering titles, using nicknames, middle names or initials, and spelling errors.

A number of carriers have developed in-house investigative systems to retrieve data from such free-form fields. These systems commonly look for names that “sound like” or “look like” a name found in the current investigation. The result often is a myriad of meaningless matches which must be sorted through before it is possible to identify genuine matches. Systems that narrow matches by conducting complex searches limit the problem. An example of a complex search would be to look at all claims originating in a 3-digit ZIP code area for an attorney with a particular last name.

When the searches are successful, they produce extremely useful data. Often, however, users report that searches are time consuming, or that the data available is too fragmentary to allow effective searches. One system we reviewed produced approximately 60 spurious hits for each actual hit.

The Internet and System Security

The Internet has created special system security problems by allowing a large population access to security violation tools.

This report is written in MS Word. We used its built-in password function to encrypt the file and to test its security.

Next, we connected to the Internet and logged on to one of the many net search sites—*Alta Vista*. At *Alta Vista*, we searched for sites defined by “MS Word” and “Encryption.” We located several dozen sites. Looking through them, we quickly found one offering free software to break MS Word encryption. We down loaded the software and attempted to access our Word file. The software failed. So we went back to *Alta Vista* and identified yet another site offering encryption breaking software.

Again, we down loaded the software and attempted to break the encryption—this time with complete success. We could not only read the document, we also learned the password.

All this had taken only 20 minutes and required no technical expertise what-so-ever.

If we had wished, we could have modified the document to add something known as a “Macro Virus.” The next person accessing the file would have activated this Macro Virus. The virus could have performed such functions as locating any claim on the system containing our names and erasing them.

During our search we noted dozens of other available programs for cracking network, WordPerfect, Excel, UNIX and other systems.

So have a care, someone with 20 minutes on their hands might just wish to access your system.

Computer Fraud Detection and Flagging Systems

Programs can be added to existing claims management systems to detect fraud, flag suspicious claims for special handling, or refer them to SIU referral. We recently completed a system that flags 12 percent of auto material damage claims for special handling. The return on investment of this special handling averages \$600 an hour!

Flagging systems range from a very simple listing of fraud indicators to sophisticated computer pattern analysis. Standard flagging systems can easily be developed in-house. IBM has developed a data mining system that uses "fuzzy logic" and data visualization technologies to identify aberrant behavior (Tom Schamber, (203) 262-3559).

Nestor, Inc., (One Richmond Square, Providence, RI 02096, (403) 331-9640) has been developing neural network models to produce flagging systems that learn from experience.

Quality Planning has developed statistics-based flagging systems that optimize the cost-effectiveness of investigative resources for insurance companies and welfare and tax agencies. (Quality Planning Corporation, 350 California Street, Suite 1760, San Francisco, CA 94104, (415) 986-1444)

Additional Computer Resources for Investigation

Vendors are offering SIUs an ever wider range of computerized investigation tools. Some of the most promising developments include

- **Low priced CD-ROM software.** A mass market is developing for low cost database products such as reverse telephone directories and street mapping software. These products can, for a few hundred dollars each provide unlimited searches replacing many of the online database search programs that charge an average of \$6.00 per search. CD-ROM's are available from the American Medical Association for medical procedure coding and billing. Medical terminology and graphic CD-ROM's available in software stores are useful in many medical claims.
- **Medium priced CD-ROM software.** In the one to ten thousand dollar price range, many of the public record databases can be purchased directly. For example, Merlin Information Services (94 5th Ave. W.N., Kalispell, MT 59901, (800) 367-6646) sells CD-ROM's containing Federal Court records, property tax records, criminal filings, voter lists, Department of Motor Vehicle records, and so on. High volume searchers find owning their own databases reduces costs, improves access and makes database searching a more routine part of investigative practice.

- **Satellite Surveillance.** PSYTEP Corporation will search 60 satellite databases worldwide to obtain a picture of a crime scene at a time specified by the investigator. Unfortunately, the resolution is only 5 meters (good for satellites, bad for investigation). Additional new tools may be coming from this direction. Several corporations are in the process of launching satellite systems with resolution up to one meter. One promising area is in using GPS satellite geo-positioning systems combined with cellular phone links to instantly track any stolen vehicle worldwide, making auto theft a thing of the past.
- **Caller ID Technology.** Telephone caller ID information can be matched to existing databases to provide one more window into organized fraud. For example, wouldn't it be interesting to know that your insured called from the attorney's office of a plaintiff bar firm to report an accident and take full responsibility? In areas where caller ID is restricted or not available, use of 800 numbers can achieve similar results. Upcoming developments in automated voice recognition and telephone-based lie detector tests also look promising.
- **Document Scanning and Optical Character Recognition.** Imagine remembering every word on every document on every claim you ever investigated and being able to cross-reference it all at the push of a button! Emerging systems allow investigators to have the computer scan documents, translate the image into texts (OCR or Optical Character Recognition), and then index every word for future retrieval. For example, the US Customs Office uses an OCR-scanning system to cross-index hundreds of thousands business records to identify potentially fraudulent tax re-ports. (This system is based on ZyScan software produced by Progressive Technologies, 19650 Clubhouse Rd, Suite 106, Gaithersburg, MD 20879, (301) 590-0900)
- **Electronic Cash.** As credit cards and other emergent forms of electronic cash replace hard currency, the opportunities for tracking cash flows associated with organized fraud increases. The hidden world of fraud is very much dependent on cash payments to conceal connections and avoid taxes. As cash declines and is replaced by electronic exchange our capacity to track who paid what to whom will grow. Currently such tracking is an important tool in the fight against illegal drugs. Look for opportunities in this area in insurance fraud.

Conclusions

Our surveys have convinced us that SIUs will be placing an ever increasing reliance on automated systems in the fight against fraud. With the current speed of change, it is not possible to predict what products and systems, in the long run, will prove most useful.

Using Technology to Fight Insurance Fraud

Daniel Finnegan, Ph.D., and Joan Marsh

QUALITY PLANNING CORPORATION

350 California Street, Suite 1760, San Francisco, CA 94104 (415) 986-1444 FAX (415) 986-4499

QUALITY PLANNING CORPORATION

350 California Street, Suite 1760, San Francisco, CA 94104 (415) 986-1444 FAX (415) 986-4499

Second Edition, September 1996

Copyright © 1996 by Quality Planning Corporation. All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the express, written permission of

Quality Planning Corporation
350 California Street, Suite 1760
San Francisco, CA 94104