6 – Dealing With fraud

# 1 – Importance of detecting and preventing Insurance Fraud

**Objective:** Explain why the following factors are important to insurers when detecting and preventing insurance fraud: Public attitude toward insurance fraud; Cost of insurance fraud to the insurance industry

Insurance fraud is often described as a victimless white-collar crime because it involves deception rather than violence and **because the victim is a company instead of an individual**. Though untrue, this perception is part of the environment in which claims representatives operate.

Claims representatives are on the front line of detecting and preventing **insurance fraud, a deliberate deception committed against an insurer or an insurance producer for the purpose of unwarranted financial gain**.

## Public Attitude Toward Insurance Fraud

Insurance fraud is common in auto insurance, workers compensation, and health claims. **While most people realize that insurance fraud leads to high insurance rates, some nonetheless tolerate some forms of claims fraud, such as slightly increasing the amount of a claim to make up for deductibles or past premiums paid (called padding)**.

Attitudes toward fraud vary with age, gender, and other factors. Insurance professionals should try to raise overall public awareness of the costs and ramifications of insurance fraud, which include criminal penalties. **Public awareness can reduce tolerance of fraud, which in turn helps insurers detect and deter it**.

## Cost of Insurance fraud

**Insurance fraud is one of the costliest white-collar crimes in the US, second only to tax evasion. The insurance Information Institute estimates that insurance fraud accounts for 10 percent of the property-casualty insurance industry’s incurred losses and loss adjustment expenses. Fraud costs roughly $80 billion per year across all lines of insurance, with about $34 billion from property-casualty lines**.

**Insurers also lose needed funds through rate evasion, which occurs when insureds make false statements on insurance applications.** For example, some insureds report false social security number to hide bad credit scores. Others apply for auto insurance and claim that their vehicles are used only for leisure when they are actually used in long commutes to and from work in urban areas.

The cost of fraud does not fall on insurers alone; it is shared by everyone. Fraud results in higher insurance premiums, taxes, and costs of goods and services. In fact, insurance fraud costs the average family in the US hundreds of dollars per year in increased premiums. **The more that insureds and the public realize its negative consequences, the less likely they will be to commit or tolerate fraud**. **Many people are unwilling to contribute money towards such efforts!**

# 2 - Types of Insurance Fraud

**Objective:** Given a claim, determine the types of fraud involved

Insurance fraud is any deliberate deception committed against an insurer or an insurance producer for the purposes of unwarranted financial gain. It can occur during the process of buying, selling, or underwriting insurance, or making or paying a claim.

To identify the types of insurance fraud, it is important to understand what constitutes fraud. **Fraud occurs when all of these elements exist:**

* **An individual or an organization intentionally make an untrue representation**
* **The untrue representation concerns an important or a material fact (a fact that is significant to a decision or matter at hand) or event**
* **The untrue representation is knowingly made**
* **The untrue representation is intended to deceive**
* **The victim relies on and acts on the untrue representation**
* **The victim suffers some detriment, such as loss of money and/or property, as a result of relying on and acting on the untrue representation**

Insurance fraud can be committed by anyone – insured, claimant, doctor, lawyer, mechanic, claim representative – involved in the insurance transaction or in a claim. For example, an applicant for workers compensation insurance may deliberately underreport the amount of payroll to the insurance agent, broker, or underwriter. The underwriter relies on the payroll information provided by the applicant to set the premium amount. The applicant’s misrepresentation causes the underwriter to charge a workers compensation premium that is lower than the premium appropriate for the risk, and the insurer thereby suffers a loss of premium income. An agent, in collusion with an applicant may overreport the square footage of a commercial building, permitting the applicant to purchase higher insurance limits with the intent of burning the building, collecting the insurance money, and splitting the proceeds with the agent. Or, an underwriter may provide an agent with a low premium quote in exchange for a payoff. Fraudulent claims may include staged accidents, inflated medical bills, and the intentional burning of an insured property. These are all example of insurance fraud.

Insurance fraud can be classified as either hard or soft. **Hard fraud involves actions that are undertaken deliberately to defraud.** False claims or intentional losses are examples of hard fraud. **Soft fraud, also known as opportunity fraud, occurs when a claim is exaggerated. The perpetrator uses the “opportunity” of a legitimate claim to obtain unwarranted person gain**.

## Hard Fraud

**Hard fraud involves schemes to defraud insurers by filing false claims for losses that have not occurred or by intentionally creating losses**. Hard fraud can be a staged or invented accident, injury, or theft that results in a false claim. Har fraud can also be an intentional loss, such as that resulting from arson.

## False Claims

**False claims arise when an insured pursues a claim for property damage or injury that has not actually occurred**. Many types of false claims involving many types of insurance coverage can be made. For example, an insured may file a homeowners claim for stolen jewelry when no jewelry was stolen, or an employee may pretend to have a back injury to get paid time off under a workers compensation policy.

False claims can also include misrepresentation (false statement of a material fact), concealment (intentional failure to disclose a material fact), or distortion of a material fact.

Examples: Store customer who intentionally pulls display items on top of themselves and then file bodily injury claims. Also, restaurants are frequently the victims of people who falsely claim injury or illness from improperly prepared food. Acts of misrepresentation.

Some claims can involve the insured’s collusion with others. Example, an auto body shop may prepare a repair estimate for alleged damage to an auto when no damage exists. Workers at a vehicle salvage yard may collude with others to purchase insurance on unrepairable vehicles; after the insurance is in effect, the owner files a false claim for damages when, in fact, the vehicle was already damaged at the time it was insured.

Examples of false claims

* An insured obtains a pre-damaged vehicle, insures it, and then claims she is a victim of a hit-and-run vehicle, the police are called to verify the property damage.
* An insured buys an expensive vehicle for a minimal down payment and sells it overseas. He reports it stolen and then collects on the insurance as well as the sales price of the vehicle
* An insured collects fine jewelry from his friends and family, he has it appraised and schedules it on his homeowners policy. He returns the jewelry to the owners and reports it stolen. He then collects on the insurance.

## Intentional Losses

**Another type of hard fraud is an intentional loss, one that is not accidental or fortuitous and that results from an intentional act**. Intentional losses can be distinguished from exaggerated and false claims**. An exaggerate claim is based on an actual loss,** but the value of the loss is inflated. **In a false claim no loss has actually occurred**. In contrast**, intentional losses involve an actual incident with resulting damage. In this case however, the accident is not accidental, and the damage is intended**.

***Staged Accidents***

An insurer sued to recover more than $4.6 million in claims payments from the participants in a staged car-accident ring in Texas. Most of the claims arose from collisions resulting when a car stopped suddenly in front of an innocent victim’s auto, allegedly causing injuries. Lawyers, law-office employees, medical clinics, and others participated in the scheme.

**Arson committed by an insured or at an insured’s direction is an example of an intentional loss.** A business owner may burn his own warehouse and file a claim to recover the insurance proceeds. Another example of intentional loss is a staged accident. The intent of those who stage accidents is to defraud an insurer. **Typical staged accidents include rear-end automobile collisions**. When the collision occurs, the scammer claims to be severely injured and to require transportation to a hospital by ambulance, while feigning great pain. Alleged injuries from staged accidents vary, but the most common involve soft-tissue injuries to the neck and back because they are harder to medically disprove.

***Examples of Intentional Losses***

* The claimant’s vehicle swerves quickly in front of the insured’s vehicle and stops abruptly, causing the insured to rear-end the claimant’s vehicle. The claimant asserts he is severely injured.
* An insured buys multiple fire insurance policies on the same house, then intentionally burns it until it is a total loss and collects the policy limits on several policies.
* An insured is in default on her car loan for failing to remit several months of loan payments. She drives the car into the lake and claims it was stolen to collect on the insurance.

## Soft Fraud

**Soft fraud, or opportunity fraud, is the exaggeration or padding of a legitimate claim for the purpose of receiving greater reimbursement than would be received for the actual loss**. Such claims may exaggerate the value of property or the severity for an injury. For example, an insured may state that a stolen computer is 6 months old rather than its actual age of 2 years to increase the value of the claim.

**Injury claims can be exaggerated or padded in several ways**. Some medical providers exaggerate claims by overtreating patients. Overtreatment involves performing more procedures, or more expensive procedures, than are medically necessary to treat an injury. These treatments may include additional or unnecessary diagnostic tests, such as x-rays, CT Scans, or MRIs; extra office visits, or extended physical therapy. Overtreatment or unnecessary treatment by medical providers can occur with many insurance coverages, including automobile liability, workers compensation and homeowners liability.

Overtreatment is a firm of medical provider fraud – that is, fraud that occurs when healthcare professionals help insureds file insurance claims for treatment that is unnecessary, is not related to the injury, or has not been rendered. The patient may be aware of the deception and go along with it, or the patient may be unaware of the scheme and may simply be following the doctors orders. The unnecessary treatment “pads” or exaggerates the true value of the claim, costing the insurer more money. The medical provider increases revenues by overtreatment.

Examples of Exaggerated/Padded claims

* Overstated value of property
* Overstated severity of injury
* Overtreatment for injures
* Unnecessary treatment for injuries

Practice Exercise:

Facts**: An employee injures his back over the weekend while helping his brother-in-law put a new roof on his house. He goes in to work on Monday morning. Within a few minutes of arriving at work, and while out of sight of his co-workers, he calls out in pain. When his co-workers come to help, he claims he injured his back lifting a heavy box**.

Question to consider: What type of fraud has occurred to make the workers compensation claim not legitimate?

Answer: This is fraud as each of the elements exists. It is not hard fraud false claim because the employee did actually injure his back. It is not hard fraud intentional loss because he did not intentionally injure his back**. It is soft fraud because he was actually injured, and the injury was accidental. However, he misrepresented when and where the injury occurred to obtain workers compensation benefits**.

# 3 – Indicators of Possible Insurance Fraud

**Objective:** Using a balance claim investigation, evaluate any fraud indicators present in the claim

Claims representatives should be trained to look for fraud indicators that can help detect fraud before a claim is paid. Paying only legitimate claims protect other insureds as well as the insurer. When fraudulent claims are not paid, other insureds pay lower premiums and the insurer can better maintain is solvency. It is also important to recognize that insurance fraud usually increases during difficult economic times.

Insurers rely on claims representatives to notice indicators of possible fraud in claims and to conduct appropriate investigations. The claims representative must also conduct a balance investigation once fraud is suspected, because fraud indicators are not proof of fraud. Fraud-fighting organizations such as the National Insurance Crime Bureau (NICB) publish a list of claim-fraud indictors. Some insurers develop their own lists of indictors.

**Many insurers now use computer programs to detect characteristics that are common to fraudulent claims. Such programs can analyze vast amounts of data across different lines of insurance to identify patterns and other similarities that may indicate fraud. Several organizations, such as the Insurance Services Office (ISO), offer electronic antifraud databases that contain claim-related records or provide access to public records that may be used to gather evidence of fraud**.

Claims representatives who are aware of fraud indicators can more readily recognize cases that warrant review by special investigation unit (SIU) or, when appropriate, referral to the NICB or to law enforcement.

## Conducting a Balanced Investigation

**Claims representatives must balance a suspicion of fraud with the possibility that a claim is legitimate despite the presence of one or more indicators of possible fraud**.

**To achieve this balance, a claim representative can frame an investigation on these grounds:**

* **Given the circumstances of the loss, what are reasonable expected actions/responses of the affected party?**
* **Is part of the reasonable action or response missing?**
* **Has something been added to the reasonable action or response?**
* **Is there physical evidence to support the reported version of the loss?**
* **Is the loss as reported physically possible?**
* **Are records available from a third party, such as a governmental agency or retailer, that can confirm or refute the insured’s version of the loss?**
* **Is there a witness to the loss, and, if so, is the witness reliable?**
* **Is the fraud indicator based on conjecture or assumption?**
* **Is there a rational explanation for the fraud indicator?**

The claims representative is responsible for meeting both the insurer – and state-mandated time frames for resolution of certain types of claims. The investigation of suspected fraud can be time consuming, and the claims representatives in many states will have to justify extending the deadline for claim resolution with specific evidence in order to continue an investigation.

**A claims representative detection of fraud fits into a broader framework of efforts on the part of government, the insurance industry, and the public to detect and prevent insurance fraud. For example, many state governments have enacted laws that help claims representatives by providing some form of protection and guidance.**

**Two protections are commonly found in the laws**. **The first involves extending the time limit within which an insurer’s investigation of a claim must be completed and the claim must be either accepted or denied. The second protection allows an insurer not to disclose to an insured that fraud is suspected if there is evidence that the insured has committed fraud.** A common element in the laws is a requirement that evidence of fraud be documented in the claim files and available for inspection by state authorities.

## Fraud indicators

Claims representatives should be alert for fraud indicators when a claim is first assigned and address these indicators during the course of their investigation. Valid reasons may exist for any of the possible fraud indicators listed in this section.

When indicators are present, claims representatives should be aware of an increased risk of fraud but should also avoid jumping to conclusions. Nothing surpasses the value of a good investigation in determining the validity of a claim.

**These are some common indicators of possible fraud:**

* **Parties involved supply vague information**
* **Conflicting information appears in documentation or witness accounts**
* **Known attorney/medical provider combination is present**
* **Database indicates multiple similar losses for the same individual**
* **Loss occurs soon after policy inception**
* **Insurer or claimant is uncooperative or evasive**
* **Insured or claimant is eager to accept blame for an accident or demands a quick settlement**
* **insured or claimant is unusually familiar with medical or insurance terms and procedures**
* **claimant threatens to hire an attorney unless claim is settled quickly**
* **no police report exists for an auto accident or theft**
* **attorney letter of representation is received shortly after the accident**
* **all of the people involved in the accident report similar injuries and use the same doctor or clinic**
* **the only address for the claimant is a post office box or a motel.**

There are many additional fraud indicators, and each insurer typically has internal procedures for identifying and handling suspected fraud cases. It is important for claims representatives to be aware of their insurers’ practices and to follow these practices when investigating claims with possible fraud. For example, **an insurer’s SIU may be investigating a suspected staged auto accident ring, and a new suspicious claim that is promptly reported to the SIU may assist in that investigation**.

# 4 – Anti-Fraud Efforts

**Objective:** Evaluate the anti-fraud efforts made by: Insurers; State government; Federal government; Industry organizations

Because insurance fraud results in an enormous cost to insurers, it is important for claims representatives to understand the resources available in the fight against fraud.

Insurers, state and federal governments, and insurance industry organizations all play a part in the US’s efforts to detect and deter fraud as well as prosecute and punish those who commit it.

## Insurers

Insures are the first line of defense against insurance fraud because they are most likely to detect and report it.

## Special Investigation Units

To assist claims representatives in detecting and reporting insurance fraud, insurers have created special investigation units (SIUs) to investigate claims that raise suspicions of fraud. Many states now mandate that insurers maintain an SIU as part of their anti-fraud efforts.

**Many SIU personnel have law enforcement and investigative experience, and some have criminal justice degrees. Such qualifications help SIU personnel conduct the intensive investigations that are often necessary to substantiate claim denials based on fraud**.

Claims representatives refer claims to SIUs based on criteria that may vary by insurer. Some insurers refer every claim that raises suspicion to an SIU. Others refer claims based on the extent of the suspected fraud, the prospects of obtaining proof of the suspected fraud, the size of the claim, or the type of coverage.

Insurers can also help combat fraud by educating individual consumers about the costs associated with insurance fraud. Some insurers are making efforts to bring awareness of the problem to schools, organizations, and consumer groups.

## Technology

Technology provides multiple ways to detect fraud and is used by insurers as well as organizations that support them**. Databases maintained by insurance-related organizations, such as Insurance Services Office, Inc. (ISO) accumulate information about insurance fraud**. These databases cross-index claims to pinpoint multiple filings and provide historical information about claimants.

**Predictive models are also used to increase the accuracy of fraud detection and to avoid false positives. Some of the more comprehensive models rely on an insurer’s expert claims representative to determine which variables (such as occupation, number of doctors seen, and injury type) are most useful in detecting fraud.** An insurer can work with data scientist to create a database of closed claims that are known to have been fraudulent. **The key is to assign a weight to each variable to arrive at a score that represents the probability that a claim is fraudulent. The weights are tweaked as the model may run through the database of hundreds or even thousands of such claims.** As the model learns how to weigh each variable, it become increasingly accurate. Eventually, predictive model reduces the number of improper referrals to an SIU. However, predictive models must be revised as criminal behavior evolves.

By enabling insurers to share fraud-related information, **blockchain offers ways to combat fraud.** **Blockchain provides visibility of transactions and can be used to manage identities of insureds and histories of insured items.** A **public ledger** associated with a particular risk **could provide a record of its value, past claims, and previous owners.**  For example, an individual may purchase an auto and insure it with six different insurers under six, different names and addresses. By having a transparent ledger associated with the car, insurers can identify fraud that would be difficult to detect otherwise.

Additionally, telematics and **the Internet of Things (IoT) offers insurers increasing amounts of data**, some of which can be used to prevent fraud. **For example, telematic devices can gather data about a driver’s history and habits for use in preventing auto claims fraud.** As an example, date from employees’ **wearables** has the potential to prevent workers compensation fraud. If an employee’s movement are tracked by a GPS enabled vest connected to the IoT, the employer and insurer will have a record to compare to an employee’s version of events. However, employee privacy must be considered as well.

## State Government

Responsibility for legal efforts to combat insurance fraud lies with a variety of city, state, and federal regulatory bodies, including state insurance departments, state fraud bureaus, and law enforcement agencies. Many state have enacted anti-fraud legislation, such as expanding the definition of insurance fraud to include reckless conduct; increasing civil and criminal penalties for committing insurance fraud; requiring insurers to cooperate with law enforcement authorities in cases of suspected fraud; **giving broad immunity from civil lawsuits to insurers that share information about suspected fraud**; and requiring insurers to form SIUs, develop anti-fraud plans, and place fraud warnings on all applications and claims forms.

Some anti-fraud at the state level:

* **Pre-inspection laws** – **to combat the dual problem of auto theft and fraudulent auto-repair** facilities, some states require insurers to physically inspect vehicles as a prerequisite to providing insurance. **Pre-inspection programs are effective in reducing theft claims for nonexistent or phantom vehicles and can deter inaccurate reporting of drivers and vehicle garaging locations that result in lower-than-adequate premium**. **Some states require photographic documentation** as part of pre-inspection.
* **Mandatory reporting** – cooperation and information sharing between insurers and law enforcement are essential in fighting insurance fraud. Most states have laws requiring insurers to report claims that raise suspicions to law enforcement authorities. Without these mandatory reporting laws, insurers may be hesitant to report fraud because they could face a civil suit if they were unable to prove the allegation,
* **Immunity laws** – to further protect insurers who report potentially fraudulent claims, **states have adopted immunity statutes.** **Most statutes grant immunity if an insurer reports information but it turns out there is no fraud, malice, or criminal intent**. Statutes vary by jurisdiction, and each should be reviewed before a report is made.
* **Civil and criminal penalties** – Anti-fraud efforts increasingly involve civil or administrative action to punish people who make fraudulent insurance claims. The advantages of this include potential recovery of civil damages and the ease of civil versus criminal prosecution.
* **Fraud prevention bureaus** – **State fraud bureaus evaluate potentially fraudulent cases submitted by insurers. After the referrals have been evaluated and enough evidence has been gathered, the information is presented to a prosecutor**. Prosecutors can become involved during any phase of the investigation; when they become involved depends on the particular case. State fraud bureaus’ scope of operations may vary – for example, a state insurance fraud bureau that is part of the state police department may have a relatively broader scope of operation than a similar bureau that is a division of the state department of insurance. **Fraud bureaus have proved to be effective, and fraudsters tend to target sates where tracking and monitoring systems are weak or nonexistent (a practice known as migrating fraud)**.

## Federal Government

Several federal statutes were enacted to help in the fight against insurance fraud:

* **Motor Vehicle Theft Law Enforcement Act of 1984** – congress passed this act to reduce the incidence of motor vehicle thefts and facilitate the tracing and recovery of stolen motor vehicles and parts of stolen vehicles. **To enable identification of stolen vehicles and parts, it required** **manufacturers of certain high-theft passenger car lines to inscribe or affix the Vehicle Identification Number (VIN) onto the engine, the transmission, and twelve major body parts**. As an **alternative,** manufacturers could install **anti-theft devices as standard equipment** in these car lines.
* **Anti car theft Act of 1992** – built on the Motor Vehicle Theft Law Enforcement Act in several ways, including increasing the number of vehicle lines covered by the **acts and making dealing with stolen marked parts a federal crime.** The act also **created the National Motor Vehicle Title Information System to help in the collection and dissemination of theft and recovery information**.
* **US Mail Fraud Statute** – **This statute defines fraud as a scheme that uses the US mail to obtain money or property by means of false or fraudulent representations**. To obtain a mail fraud conviction, a prosecutor must prove that facts surrounding the offer were intentionally misrepresented and that US mail was relied on the carry out the scheme.
* **False Representation Statute** – is a civil law used to protect the public (including insurers) from aggravated monetary loss **when proving fraudulent intent is difficult**. If the Postal Service sues the fraudster based on evidence obtained by postal inspectors, it need only prove that a particular representation was made, that it was false and that money or property was sought through the mail.

## Industry Organizations

Many industry organizations are dedicated to the reduction of insurance fraud. Most provide services such as access to a shared database or education and training to strengthen an insurer’s ability to fight fraud:

* Insurance Services Office, Inc (ISO) – ISO provides a proactive fraud detection software tool, ISO Claim Search, for claims representatives. The software can find hidden connections between claims files, such as several claimants from different claims files using the same address or social security number.
* National Insurance Crime Bureau (NICB) – **NICB fights auto insurance crime through data analytics, investigations, training, legislative advocacy, and public awareness**. National Insurance Crime Bureau “About NICB are primarily commercial and personal lines property casualty insurers, self-insured organizations, rental car companies, parking services providers, and transportation-related firms.
* **Coalition Against Insurance Fraud (CAIF**) – CAIF is a diverse group that includes consumers, insurers, legislators, and regulators. **It advocates measures to detect, prosecute, and deter fraud**.
* **International Association of Special Investigation Units (IASIU**) – **IASIU offers professional development for special investigators who typically are employed by insurers, self-insurers, or third-party claim administrators**. **I additional to organizing an annual educational conference, the IASIU created and administers the Certified Insurance Fraud Investigator (CIFI) certification**.

# 5 – Detecting Claims Fraud With Network Analysis and Clustering

**Objective**: Explain how network analysis and clustering can be used to detect claims fraud

Insurers have incorporated the expanding field of data analytics into many aspects of their operations, but they’ve been especially quick to embrace its use in fraud detection. Network analysis, made possible by data analytics, is a particularly useful method of detecting and preventing ever-evolving fraud schemes.

**Network analysis – the study of nodes (vertices) and edges (lines) in a network.**

About 10% of the property-casualty insurance industry’s incurred losses and loss adjustment expense stem from fraud. Insurers attempt to detect fraud by identifying patters, controlling underwriting at the points of sale, and using special investigation units (SIUs). **Advances in data mining techniques- including network analysis and clustering – are enabling insurers to more effectively identify patterns in fraudulent claims activities. Insurance and risk management professionals therefore benefit from understanding how to analyze links in a social network and clusters of data points**.

**Data mining – the analysis of large amounts of date to find new relationships and patterns that will assist in developing business solutions**.

Suppose that a regional insurer is concerned about its auto-related claims. IN particular, this insurer has experienced a significant increase in the number and settlement amounts of auto physical damage claims. While its claims representatives and SIU currently identify 1% of its auto claims as fraudulent, the insurer’s upper management believes, based on industry data, that the number of fraudulent claims is actually much higher. The insurer is hesitant to spend its resources on increasing its claims staff, nor does it want to continue to raise its auto rates because of the increase in claims. Investing in data mining and predictive modeling seems to be the best long-term solution.

The insurer will conduct these activities to identify fraudulent claims:

* Detecting claims fraud through traditional fraud indicators and through mining social media data
* Applying network analysis by examining links and suspicious connections
* Apply cluster analysis to discover claims characteristics that might indicate fraud

## Detecting Claims Fraud

The insurer’s claims representatives were already following the insurer’s protocol for identifying fraudulent claims. Insurers rely on claims representatives to notice indicators of possible claims fraud and to conduct appropriate investigations**. Examples of fraud indicators include an insured or claimant who pushes for a quick settlement or has too much or too little documentation**. However, **the claims representative must conduct a balanced investigation once fraud is suspected because fraud indicators are not proof of fraud**.

Fraud-fighting organizations, such as **the National Insurance Crime Bureau, publish lists of claims-fraud indicators. In addition, the insurer has developed its own lists of indicators and uses a computer program to detect characteristics common to fraudulent claim**s. Such programs analyze vast amounts of date across different lines of insurance to identify claims patterns and other similarities that may indicate fraud**. Several organizations, such as the ISO, offer electronic antifraud databases that contain claims related records or provide access to public records that may be used to gather evidence of fraud**. Based on which indicators are identified, claims representatives decide whether a case warrants review by the SIU.

**Although the insurer is already taking many of the appropriate steps to identify fraudulent claims, some fraud still goes undetected. One reason for this is that the insurer is using fraud indicators, the traditional approach to fraud, which means that it’s depending on fraud that has happened in the past. Intelligent and innovative fraudsters will change their approaches and patterns, limiting the usefulness of these indicators**. **The traditional approach to detecting fraud is also highly subjective and depends on claims representative’s experience in the field**. **A more automated approach would allow for greater objectivity and enable new claims representatives to be more effective in less time**.

The insurer has begun encouraging its claims representatives to search social media for any indicators of fraud, and it will continue to do so. Claims representatives can often find evidence that someone may be lying by comparing his or her social media posts with his or her statements in a claim. For example, a care could be reported as stolen on Thursday while photos show it in the insured’s driveway the next day. Or a claimant could complain of extreme back pain but post a status update about dancing.

As useful as these methods may be, however, truly efficient use of data mining and predictive modeling to detect fraud goes a step further and analyzes not only social media posts but connections withing a network as well.

## Applying Network Analysis

**Network analysis** can be applied to social media through **social network analysis – the study of the connections and relationships among people in a network** – as well as to claims files to detect possible fraud. Certain situations indicate possible fraud, such as multiple people living at the same residence claiming an auto accident in one month or numerous claims involving the same auto repair shops and/or doctors. While claims representatives might be able to pick up on these signs, it would likely be by chance. A particular street address or a doctor’s last name would not be included among traditional fraud indicators. **By using a machine to analyze the networks, connections are readily detected**.

The insurer conducts a network analysis and discovers a fraud ring in which a relatively small number of drivers and auto body shops have participated. The repair shops have been marking up their claims for repair times and parts used to make a profit. **All the participants in the fraud ring – the drivers, witnesses, and auto repair shop owners - know each other and are in the same social network**.

## Applying Cluster Analysis

**The insurer wants to train a predictive model to help identify fraudulent claims as they are submitted**. **It has the attributes it has already used as fraud indicators, and it has identified a fraud ring through the use of network analysis**. However, the insurer believes that **some fraud has still gone undetected**. **One of the limitations in building predictive models is that they are based on historical information – attributes the insurer has already identified as being associated with fraud. This creates several problems. First, because insurers do not identify all fraudulent claims, they often do not have all the historical information needed to develop an effective predictive model. In addition, fraud is ever evolving, with fraudsters constantly changing their tactics and targets, so predictive model may quickly become outdated. The insurer needs a way to identify new trends as they emerge**.

A solution to the problems inherent **in predictive models – and an alternative to the already performed network analysis** – is **unsupervised learning (machine does not have a defined target variable**) by means of **cluster analysis (a model that determines previously unknow groupings of data**). The cluster analysis will use **k-means (an algorithm in which “k” indicates the number of clusters and “means” represents the clusters’ centroids**) to group data into clusters of claims closest in distance (and therefore similar) to each group’s **centroid (center of a cluster**).

Suppose that the regional insurer performs a cluster analysis of all its auto physical damage claims. The results show a cluster of claims amounts ranging from $8,000 to $10,000. This cluster draws the claims department’s attention because it is removed from the other auto physical damage claims clusters, the amounts of which are primarily either under $2,000 or from $3,000 to $4,000. Several of the claims in the outlier cluster are confirmed fraudulent claims. A claims representative confirms that several of the other claims in the cluster were flagged suspicious. It is highly unlikely that all the claims in the cluster will be found to be fraudulent; most likely, one or more other attributes, in combination with the claims amount, will distinguish the fraudulent claims. Especially, the fraudulent claims are outliers within the already outlying cluster.

The insurer’s SIU now has sufficient reason to investigate this cluster of claims. If a significant number of claims are confirmed to be fraudulent, the insurer has just discovered another attribute (or attributes) it can include in its predictive model. Claims likely to be fraudulent will be referred to an experience claims representative or the SIU. However, the fraudulent activity identified by this cluster analysis will eventually be suppressed, and fraudsters will develop other schemes to defraud the insurer. The insurer must be prepared to reevaluate the attributes of its predictive model and it will probably have to perform additional cluster analyses as time goes on. Doing so will allow the insurer to stay ahead of many fraudulent claims instead of relying on dated indicators.