Big Data Analytics as an Opportunity for Fraud Management in the Insurance Sector

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"We once came across someone whose left leg was amputated according to his last hospital visit but there he was standing on his two feet with another medical need."
Julia Ouko NHIF principal Health Contracting.
3rd March 2019

"We have noted cases where a hospital has ten staff and at one point all the staff were admitted as patients in the same hospital," NHIF Manager in charge of Benefits and Contracting.
3rd March 2019

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In Local news….

NHIF investigating 80 health centres over fraud claims, suspends 7

February 28, 2019

7 SHARES

By JULIE OWINO,

NAIROBI, Kenya, Feb 28 – The National Hospital Insurance Fund has confirmed that 80 health facilities are under investigation for involvement in medical claims fraud while 7 health facilities have been suspended.

The Fund said health centers in Mount Kenya region, at the Coast and some parts of Western Kenya are notorious in fraud cases.

NHIF Claims and Benefits Manager, Judy Otele, said impersonification, upcoding and fake surgeries are the three leading ways health centers are perpetuating fraud.

Gilbert Osoro, Benefits and Contracting manager at NHIF said the social health insurer will invest in technology such as SMS with information of the facility, nature of treatment and amount charged of the patient to curb the rising fraud cases in over the 8200 health centers covered by NHIF.

Over Sh10 billion feared lost in new NHIF pay scandal

By Cyrus Ombati And Roselyne Obala @ 25th Feb 2019 00:10:00 GMT +0300

The National Hospital Insurance Fund (NHIF) could have lost more than Sh10 billion in false medical claims, investigations have said.

Sources said the figure had been flagged as fraudulent and was part of about Sh50 billion paid to NHIF by Treasury as capitation premiums for medical cover for civil servants, Kenya Police Service, National Youth Service and Kenya Prisons Service since 2013.

Payment arrangement

DCI Raises Alarm Over Massive Fraud Cases at NHIF

By LYNDA ODHIAMBO on 25 February 2019 - 9:58 am

NEW SCANDAL

The NHIF Building in Nairobi DAILY NATION

The Directorate of Criminal Investigations has launched investigations on NHIF after a directive by the courts to probe the accounts and invoices for the firm.

DCI is investigating how NHIF officials squandered up to Ksh12 billion from beneficiaries who have not sought medical treatment from any hospital.

Detectives had obtained a court order requiring the hospitals to produce books of account, invoices, and claims for payment by NHIF from 2013 to date.

Parliament passes Bill introducing penalties for insurance fraud

1 month ago David Indeje

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The Kenya National Assembly on Thursday has passed the Insurance (Amendment) Bill 2018 introducing penalties for insurance fraud.

The Bill if assented into law, will ensure that insurance companies comply with the standards of the International Association of Insurance Supervisors (IAIS) on addressing insurance fraud.

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The Challenge

- Impact on Customer Satisfaction
- Costs of Investigation
- Pressure from Industry Regulators
- Impact on profitability

Industry Overview

6.5%
Industry growth
2017

$ 1B
Net Claims paid
2017

$ 5M
Medical Loss Recorded
2017

$ 2B
Premiums
2017

$ 200M
Medical Claims paid
2017

$ 56M
NHIF Major Surgeries
2017/2018

INSURANCE INDUSTRY

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Detecting Fraud

The traditional approach is based on developing heuristics around fraud indicators

Machine Learning

Supervised learning

- Models are trained to discriminate between fraudulent and non-fraudulent behaviour.

Unsupervised learning

- Models a baseline distribution that represents normal behaviour and then attempt to detect observations that show greatest departure from this norm.

Reinforcement learning

- Intermediate between supervised and unsupervised.

Machine Learning

Credit Card Fraud Detection

Motor Insurance Fraud detection

Medical insurance fraud detection

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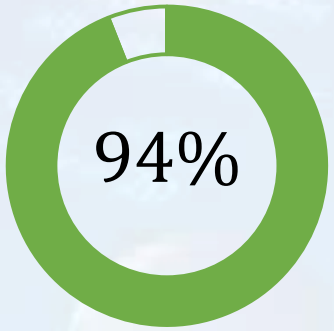
Medical Insurance Fraud

Precision



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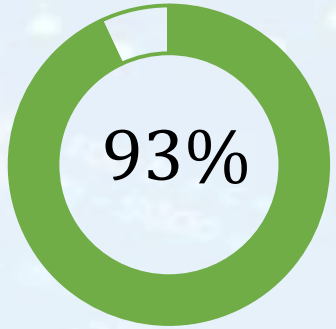
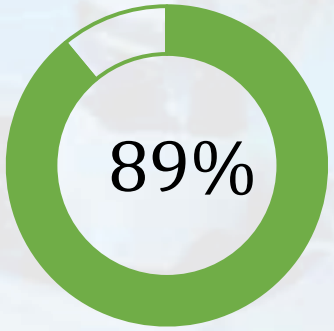
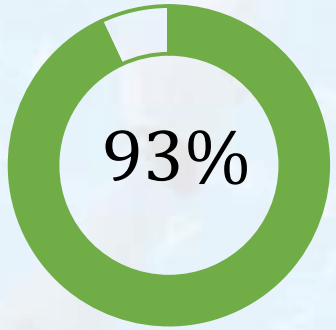


Recall



F1-Score



XGBoost

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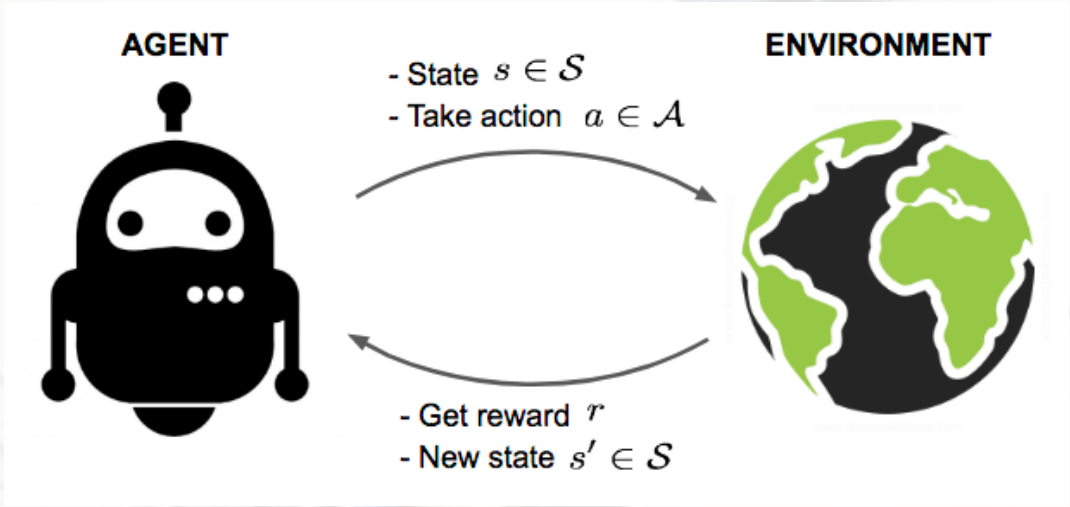
In business terms ....

Insc Claim Amt Reimbursed			
		Predicted	
		Not Fraud	Fraud
Actual	Not Fraud	40%	7%
	Fraud	9%	45%

IP Annual Reimbursement Amt			
		Predicted	
		Not Fraud	Fraud
Actual	Not Fraud	54%	3%
	Fraud	6%	37%

OP Annual Reimbursement Amt			
		Predicted	
		Not Fraud	Fraud
Actual	Not Fraud	59%	2%
	Fraud	4%	34%

What next?



Reinforcement Learning

- Deep Reinforcement Learning (DRL)

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