Index

A
Abraham, Jay, 65
account behavior, deviations in, 82
account take-over fraud, 70
ACH. See automated clearing house (ACH)
acquisition/merger, 53
address change, 84
“The Adventures of Copper Beeches” (Doyle), 39
advertisement monetization, 13
after-death experience, 85
air disaster risk, 64–65
Albom, Mitch, 85
American Express, 24, 26, 29
American Express cards, 26
analytical fraud management process, 71
analytics for fraud management, 89
analytics teams, 90
analytics-based scoring system, 96
anomalies in data, 55, 76
application transactions, 92
approve-or-decline decision, 12
Aristarchus of Samos, 41
assets to pay back a loan, 4
ATM terminal, 18, 27, 33, 82
ATM withdrawals, 18, 33, 68–69, 82
authenticating customer’s identity, 28
authentication, 8, 106
methods, 5, 30
protocols, 27
system, 70
authorization transactions, 20
automated clearing house (ACH), 20, 97, 112
automated predictive dialers, 101
average transaction amount, 125
averaging approach, 105
avgMCCrsk, 126
avgPOSrsk, 126

B
Babbage, Charles, 67
balance inquiry transaction, 69
Bank of America, 24
BankAmerica Service Corporation, 25
bank-developed rules, 91
bankruptcy, 19, 93
basis point (BP), 95
behavioral input, 7
modeling, 5, 13, 17, 33, 42, 45–46, 162
models, 43, 46, 56, 60
behavior-based models, 28
behavior-based segments, 79
“below the radar,” 122
Berra, Yogi (American baseball catcher), 6
Biggins, John (banker), 24
BIN number, 29
biostatistician, 42, 161
Black Swan (Taleb), 6
BP. See basis point (BP)
Brahe, Tycho, 41

C
card authorizations, 50
card fraud, 95
cardholder’s behavior, 5, 32
cardholder’s monthly statement, 19
card-not-present fraud, 28, 99
card-not-present transaction, 50
card-present transaction, 50
cash deposits, 6
cash users, 81–82
cash withdrawals, 6, 27, 92
casual fraud, 83
cat and mouse game, 122
causal relationships, 41–42
central limit theorem (CLT), 43
change monitoring, 73
“Charge-It” card, 24
charge-off risk, 19
charitable organization donation, 29
checking account fraud, 70
chip card, 50
Churchill, Winston, 55
Clark, Frank A., 86
closed-loop system, 24
cloud computing, 74
CLT. See central limit theorem (CLT)
coin flipping, 95
competitive advantage, 51–52
conditional probability, 65
conditional risk, 64–65
confidence intervals, 7
corporate-based models, 112–13
counterfeit card fraud, 29
Covey, Stephen, 65, 162
credit
limit, 26
line, unspent, 9
risk, 19, 30–31, 36, 66, 76, 91, 93, 95, 101
risk losses, 9
risk management, 36
credit card(s), 4, 10, 25
affiliated with Visa and MasterCard, 25
fraud, 9–10, 23, 30–31
fraud losses, 12
high interest rates on, 4
offers, 11
portfolios, 4–5, 19, 25–26
system, national, 24
thefts, 19, 27
transactions, 12
"Credit Card and Payment Efficiency"
(Sienkiewicz), 23
cryptographic messages, 13
cryptography, 13
customer
acquisition, 3
annoyance, 79, 100
behavior based on past history, 5
complaints about fraud, 21
expectation, 44–46
insight, 13
level information, 57
service, 22, 30, 89
touchpoint, 13
customer’s identity, authenticating, 28
cyber-attacks, 106
cycle of improvement, 88
D
Da Vinci, Leonardo, 153
data
analysis, 6, 13, 91, 119
anomalies, 112
anomalies in, 55
assets, 48, 52–53, 75
associated, 17
for behavioral models, 46–47
changes, 51, 55
collection, 42
field changes, 71, 112
handling, 119
mapping, 73
mining, 100–101
from “monetary” transactions, 68
proliferation, 40
science, 109, 162
storage, 16
streams, 51
warehouses, 55, 71, 74, 103–4
data environment, 73
1. know your data, 47–48
2. collect all data you can from day one, 47–51
3. allow for additions as the data grows, 47, 51–52
4. if you cannot integrate the data, you cannot integrate the businesses, 47, 52–53
5. when you change the definition of a field, it is best to augment and not modify, 47, 53–54
6. document data you have as well as the data you lost, 47, 54
7. when change happens, document it, 47, 55
8. ETL: “extract, translate, load” (not “extract, taint, lose”), 47, 55–56
9. data model is an impressionist painting, 47, 56–57
10. top two assets of any business are people and data, 47, 57–58
database storage, 52
data-checking processes, 17
data-driven
decisions, 50
evironment, 50
fraud detection systems, 13
fraud management system, 91,
110–12, 110 f.1
highend analytical system, 90
organization, 75
predictive modeling, 39
risk management, 37–38, 68
system to combat fraud, 20
techniques, 55
debit card
fraud, 23, 30–31, 70
number, 69
silo point of view, 70
transactions, 12
decision keys, 35
defined fields, repurposing, 72
dichotomous variable, 124
Diner’s Club cards
Dish, 13
Disraeli, Benjamin (Prime Minister), 7
dollars at risk, 66
domain expertise, 40
domain experts, 100, 103
domestic wire, 20
Doyle, Arthur Conan (author), 39–40
Dulany, Paul, 22

E
eCommerce transactions, 28
economies of scale, 25
Einstein, Albert, 149
electronic goods, 10
electronic store purchases, 10–11
end-to-end monitoring, 117
enterprise fraud management, 71
enterprise fraud modeling, 70
entropy of system, 73–74
ether theory, 41
expiration date on card, 29
extract, translate, load (ETL), 55–56

F
face-to-face interactions, 3
false positive(s), 122
rate, 66
ratio, 99, 102, 116, 155–56
transactions, 78
field definition, 54, 75
field documentation, 72
financial forecasting, 76
financial institutions, 3
financial marketplace consolidation, 52
First Data Corporation, 25
first-party fraud, 21, 159
Fisher, Ronald Aylmer, 60
fraud
analysis, evolution of, 8–9
analyst, “smile and dial,” 84, 99
analysts, 35, 83, 86, 94, 101, 104
automated process of detecting, 5
banks are vulnerable to, 3
card-not-present, 28
control results, 89
control systems, 87
data, accurate, 36–37
departments, 9
detection, 14
detection performance, 79, 82, 122
detection solutions, 153
detection systems, 2, 13, 19–21, 32,
34–36, 68, 82, 84, 86, 88, 90, 93,
96, 98, 100, 102, 107
detection techniques, 34
episodes, 18–20, 36, 70, 80, 82, 84,
92, 94, 97, 102, 156, 159
evolution of, 2
experts, 10
in financial institutions, 19
in Hindu mythology, 2
losses, 22, 26, 31, 154–56
lost-and-stolen, 28
management, 46, 153–56
management departments, 65, 78
management exercise, 77
management groups, 88
management in banks, 22–23
management infrastructure, 90
management mindset, 85
management of credit cards, 22–23,
29, 32, 34–37
management system data-driven, 91,
110–12, 110 f., 16
management systems, 83, 89,
91, 104
management units, 86
managers, 66, 86, 122
oldest case of, 2
operations analysts, 96
in a particular zip code, 103
pattern, 154
in present day, 2–3
rate, 124–25, 150
risk, 6, 12, 19, 22, 30, 35, 64, 66–67,
81–82, 91, 95
risk management, 66
fraud (continued)

rules, 77–78
score, 35, 79, 83–84
scoring systems, 7
stigma associated with, 2
strategies, 31, 50, 94, 100–101, 103–5
strategy development, 116
time-sensitive nature of, 101
transactions, 123–24

fraud analytics, 121
data, 126, 128
logistic regression 1, 132, 132t7.9, 133t7.18
logistic regression 2, 136–37
logistic regression 3, 141–43
logistic regression 4, 145–47
neural network 1, 134, 135t7.19, 135t7.21
neural network 2, 138–39
neural network 3, 143–44
neural network 4, 147–48
probability of detection versus
probability of false alarm, 123t7.1
regression 1, 128, 131t7.5, 131t7.8
regression 2, 134–36
regression 3, 140
regression 4, 144–45
SAS system, 127t7.1
statistics, 128

fraud metrics, 86
fraud model, essentials of
building a, 112
fraud model performance, 98, 154
fraud models, challenges in operationalizing
1. operations personnel need to understand the fraud score concept, 94–98
2. score development process must consider operational use and constraints, 94, 98–101
3. fraud strategies should complement and not compete with the fraud score, 94, 101–4
4. fraud strategies and operational processes should be well documented, 94, 104–5
fraud-related decisions, 45

anonymity of, 3
prefer night-time, 10
sophisticated, 3, 87
use loopholes in the system, 71
fraudulent
application, 31, 98, 101, 104
behavior, 21, 37
patterns, 5
purchases, 27
transactions, 19–20, 37

frontline employees, 118

G
Gaddis, William, 153
Gerson, Emily Starbuck, 24
goal setting, 86
Goodnight, Jim (CEO), 57
governance requirements, 91
granular data, 49–50
granularity in classification, 52

H
Hades (God of death), 23
Hammurabi (Babylonian ruler), 155
Hegestratos, 1–3
high-throughput environment, 115
historical data, 112
historical transactional data, 92
“The History of Credit Cards” (Woolsey and Gerson), 24
Holmes, Sherlock, 39

I
ID theft, 20, 33
identity, your, 9
“If” (Kipling), 60–61
impressionist paintings, 56–57
insurance money, 1
intelligent systems, 58
InterBank Card Association, 25
interchange revenue, 11
internal fraud, 112
international wire, 20
Internet data, 59
Internet merchants, 28
Internet pop-up ads, 44
Internet shopping, 29
Internet site, anomalous activity at, 34
intrusive questions at website, 28
intuition, 64
IP addresses, 106
The Five People You Meet in Heaven
(Albom), 85

K
key business problems, 51
key field information, 73
Kipling, Rudyard, 60
“kitchen sink” model, 78
knowledge-based businesses, 58

L
laws of thermodynamics, 73
“lies; damned lies; and statistics,” 7
life cycle of customer’s bank dealings, 85
life cycle of data, 85
linear regression models, 80, 122, 124, 136
linear statistical models, 46
logistic regression, 124, 126, 128, 148–50
regression 1, 132, 132t7.9, 133t7.18
regression 2, 136–37
regression 3, 141–43
regression 4, 145–47
lost-and-stolen fraud, 28, 99
low credit risk, 111

M
magnetic stripe on card, 29, 50
Manuscript on Deciphering Cryptographic Messages
(Al-Kindi), 13
marketing-related decisions, 45
MasterCard, 25–26, 28–29
mathematical algorithm, 6
MCC codes, 125–26
MCC risk, 126
merchant category code, 77
metadata layers, 49, 71, 74
Michelson and Morley experiment, 41
Mid-America Bankcard Association, 25
mini statement, 69–71
missing data, 54, 71, 76
mobile channel, 60
model performance measurement, 94
model score, 35, 100
model suite implementation, 116–17
model-based systems, 78, 80
modeling, advanced, 76
modeling algorithms, 124

“Models should be as simple as possible, but not simpler,” 149–51
monetary damage, 40
monetary losses, 94–95
money lending, 3
monitoring and fined tuning, 115–16
multi-entity behavioral modeling, 33
multiple entities in real time, 83

N
national credit card system, 24
network intrusion, 34, 112
network–based behavior models, 12
neural network
about, 30, 78–79, 124–26, 128, 134, 149–50
back propagation, 81
models, nonlinear behavior–based, 30
network 1, 134, 135t7.19, 135t7.21
network 2, 138–39
network 3, 143–44
network 4, 147–48
new data feeds, 87
New York’s Franklin National Bank, 24
“no one is indispensable,” 75
non–cash users, 81
non–fraud transactions, 78
nonlinear models, 46, 78, 124
nonlinear statistical models, 11–13
nonlinear techniques, 158
non–monetary transactions, 69–70
normal behavior of customers, 17–18

O
odd behavior, 5
Ohnstad, Mitch (reporter), 3
open-loop system, 25
operational processes and constraints, 101
operational rule, 154
originator–beneficiary combination, 33
“out of character” transaction, 82
over–limit approval decisions, 91

P
Passages from the Life of a Philosopher
(Babbage), 67
password, 5, 28
past information, 104
perceived risk, 64
personal information, 44  
phone number change, 84  
PIN number, 69, 82, 84, 93, 106, 109  
point of sale (POS), 12, 69, 97, 107, 125  
codes, 125–26  
risk, 126  
Powell, Colin (General), 40  
predictive (detection) analytics, 121  
predictive modeling, 17, 39, 50  
predictive models, 17  
premier customers, 98  
process improvement, 86  
production monitoring of data, 68  
Protos, 1  
proxy documentation, 72  
Ptolemy’s theory, 41  
purchase behavior, abnormal, 34  

Q  
quality checks of data, 50  
quality control, 155  
quantifiable losses, 93  
quantifying fraud  
accurate data, importance of, 22  
behavioral models, 30–31  
credit cards, 23–26  
data storage and statistical thinking, 16–17  
fraud, card-not-present, 28–29  
fraud, lost-and-stolen, 26–28  
fraud detection, using it effectively, 35–37  
fraud detection across domains, 33–34  
fraud episode, recording the, 19–21  
fraud in credit card industry, 22–23  
fraud management, 31–33  
modeling, supervised vs. unsupervised, 21–22  
non-fraud behavior, understanding, 17–18  
potential risk, quantifying, 18–19  

R  
rank-ordering tool, 102  
reason codes, 103, 104  
recording frauds, 21  
regression 1, 128, 131t7.5, 131t7.8  
regression 2, 134–36  
regression 3, 140  
regression 4, 144–45  
regulatory scrutiny, 101  
right attitude, 117–19  
rip-and-replace policy, 119  
risk calculation, 59  
risk management, 7, 14  
risk management systems, 88  
risk/reward equation, 4  
Roosevelt, Eleanor, 163  
rules-based systems, 78–80, 90, 102  
Russell, Bill (basketball player), 90  
Russian IP address, 106  

S  
SAS system, 127t7.1  
Schmidt, Eric (Google), 16  
score algorithms, 59  
score-based queues, 96  
scoing processes, 83  
scoing systems, 59, 80, 82, 86, 96  
seasonality of fraud episodes, 92  
second law of thermodynamics, 73  
secured lending, 4–5, 9, 12–13, 20  
security questions, 28  
semi-supervised modeling, 21, 158  
The Seven Habits of Highly Effective People (Covey), 65  
Shewart, Walter (Bell Labs physicist), 155  
Sienkiewicz, Stan (Federal Reserve Bank of Philadelphia), 23  
signatures, 9  
Sisyphus, King, 23  
skinned data, 82  
skinned debit card, 70  
skimming, 27, 82  
small-dollar charges, 10  
sourcing the account, 111  
spending limits, 9, 84  
standards of privacy, 44  
Stanhope, Philip (British statesman), 18  
statistical modeling, 6–7  
statistical models, 6–8, 11  
statistical thinking, 16–17  
statistics, 128  
supervised modeling, 21  
supply chain management, 109  
Sutton, Willie (bank robber), 3  

T  
Taj Mahal, 46  
Taleb, Nassim Nicholas (author), 6
target-based modeling, 21
Taylor, Russell C., 153
ten commandments of fraud management
1. garbage in; garbage out, 67–71
2. no documentation? no change, 67, 71–75
3. key employees are not a substitute for good documentation, 67, 75–77
4. rules: more doesn’t mean better, 67, 77–79
5. score: never rest on your laurels, 67, 79–83
6. score + rules = winning strategy, 67, 83–85
7. fraud is everyone’s problem, 67, 85–86
8. continual assessment is the key, 67, 86–87
9. fraud control systems: if they rest, they rust, 67, 87–88
10. continual improvement: the cycle never ends, 67, 88
text data, 58–60
text-mining algorithms, 59
thin-client access, 74
third-party fraud, 21
Thiruvalluvar (poet), 2
3D Secure protocol, 28
“time-on-books,” 53
“time-since-first-transaction,” 53
transaction(al)
amount, 125
dates, 125
details, 92
information, 92		
times, 125
zero monetary loss, 93
traveler’s checks, 24
U
unsecured lending, 4–5, 9, 12–13
unsecured loan, 4
U.S. Postal Service, 24
V
verification calls, 102
“Verified by Visa,” 27
video camera at ATM, 27, 69
Visa, 25–29
W
Wallis, Lynn, 113–14
Wells, H. G., 17
wire fraud, 112
withdrawal transaction, 17
Woolsey, Ben, 24
X
Xenothemis, 1–2