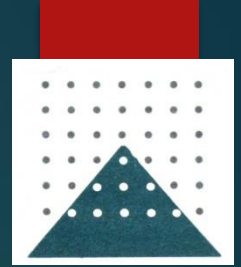# Creative Business Decisions

SMARTER MODELS. SMARTER DECISIONS.

12 Roszel Road, Suite B-103
Princeton NJ 08540 USA
Phone +1 609 452 9551 Fax +1 609 452 0614
www.cbdcredit.com

About CBD

Creative Business Decisions is a decision management solutions company, headquartered in Princeton, New Jersey.

We help our clients:
- *Increase their customer base without increasing risk.*
- *Reduce default rates and save on credit losses.*
- *Measurably lower the cost of collections.*
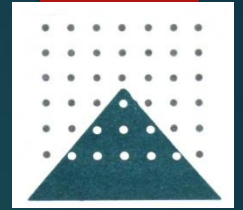- *Increase the lifetime value of customer relationships.*

Over the last 30+ years, we have helped hundreds of large and small companies around the world, to optimize returns on their credit portfolios through the optimal use of our custom built empirical, judgmental and behavioral scoring models.

2

Customer Segments
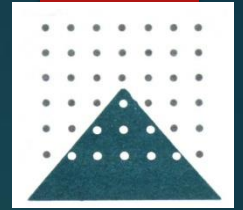
- **Auto finance – Prime, Non-Prime and Sub-Prime.**

- **Buy Here Pay Here lenders.**

- **Financial institutions – banks, credit unions, mortgage and finance companies.**

- **Small lenders – jewelry stores, auto dealers, department stores, leasing companies.**

- **Utility and telecom companies –telephone, cellular, cable, electric and gas.**

- **Insurance companies.**

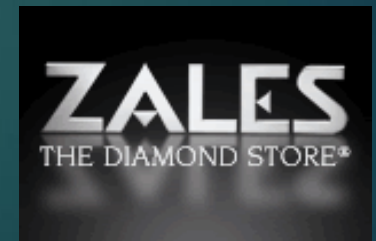- **Internet based retailers of high-end products.**

3

Select Customers

EDS

AMERICAN EXPRESS

Ivan Smith FURNITURE
Saving you more on the look you want.

citigroup

TIB BANK

Fleet

SAFCO

verizon

THE BANK OF NEW YORK

YAMAHA

Fidelity BANK
that's how.

Garfinckel's

HSBC — The world's local bank

usbank
Five Star Service Guaranteed

AT&T

TIDEWATER FINANCE

verizon wireless

Mercedes-Benz

US AUTO CREDIT

Shell

ZALES
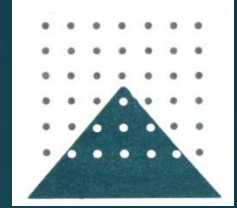THE DIAMOND STORE®

LACKS
YOUR HOME CENTER

M — Moody's Investors Service

NATIONWIDE ACCEPTANCE

BB&T

CBD Scoring Models

- *Credit evaluation models*
- *Generic scoring models*
- *Behavioral scoring models*
- *Profitability models*
- *Bankruptcy prediction models*
- *Solicitation models*
- *Target marketing models*

Related Services

- *Tele marketing Strategies*
- *Credit Check-up*
- *Collection strategy analyses*
- *Debt-Burden Analysis*
- *Risk Based Pricing*

5

Select Customers information

COMPANY NAME	PRODUCT	YEAR STARTED & REGION	SUBSEQUENT WORK
Verizon Landlines & Verizon Wireless	Evaluation & Behavioral models	1998 – Nationwide	Revalidation every 2 years. New models in 2014
Yamaha Motor Lending	Evaluation models and Software – Power sports	2014 – Nationwide	Two scorecards and complete software – TCI integration.
Nationwide Acceptance Corp	4 credit eval. models – sub-prime auto	2007 – Nationwide	Monitoring every quarter. Validation every 2 years
Tidewater Finance	Auto & Furniture models – deep sub-prime	2006 – All across USA	Validation every 2-3 years
Summit Auto	Decision Tree rules for sub-prime Auto	2012 – South East	Software rules & flow changed periodically.
C & F AUTO FIN.	Credit eval. Models & software	2015 – Nationwide	Revalidation done 2018. Comprehensive software created for score and price

# Some Benefits attained by clients
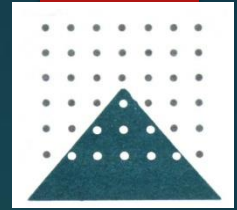
PARTIAL LIST:

APEX ; CAR HOP ; CARE PAYMENT ; FREEDOM ACCEPTANCE CORP ; GAFCO ; KITCH ACCEPTANCE ; MARK ONE ; PEARSON PUBLISHING ; PELICAN FINANCE ; ROYAL FURNITURE ; IVAN SMITH FURNITURE ; SAFCO ; CAPITAL BANK ; AC AUTOPAY ; CORNWELL TOOLS ; YAMAHA

- Lowered cost of processing using CBD's software. Cornwell Tools, Freedom Acceptance, and Summit Auto are spending substantially less.

- All clients have attained consistency in making Lending Decisions

- Automated lending decisions (Tidewater is doing 100% automated decisions)

- Monitoring & Tracking accomplished for greater management control by most clients

- Compliance with Federal & State Credit Regulations can be easily demonstrated using scorecards

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Some Benefits attained by clients cont…
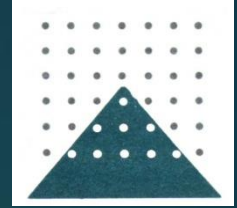
Nationwide Acceptance Corp (NAC):
Reduced charge-offs and increased approvals

"We have been working with Pat and his team for over 11 years and attribute a good part of our success to the good work they have done. Recently we updated our scorecards which incorporated machine learning methods and we are very pleased with the results. I highly recommend CBD and Pat Nanda!"

— Martin Less, President

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Some Benefits attained by clients cont…

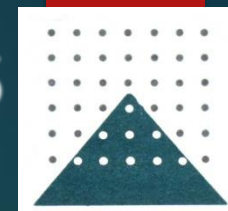First Investors
We Put Investors First
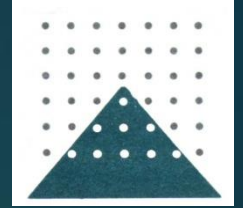
First Investors: **Reduced charge-offs by 42%.**

"We feel that your scorecard is providing us with an excellent tool to manage the risk profile of our loan portfolio. We wish to express our appreciation for a job well done"

— Mike Ogg, Credit Manager & Roberto Marchesini, Risk Manager

# Some Benefits attained by clients cont…

Verizon: **Increased savings.**

"We have worked with CBD for many years, both in the development of underwriting models and behavioral models. Over the years these models have gone through several revalidations and redevelopments to help maintain model performance. We have been very happy with the quality, professionalism and expertise from CBD, in addition to the on-time service delivery for each project. I will recommend them highly "

Dan Francia, VP Finance
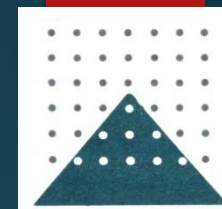
Some Benefits attained by clients cont…
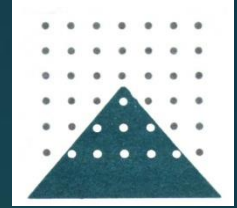
Lacks Furniture: Saved $1.6 Million.

Reduced losses due to write-offs and bankruptcies by 33% within a year of deploying CBD models.

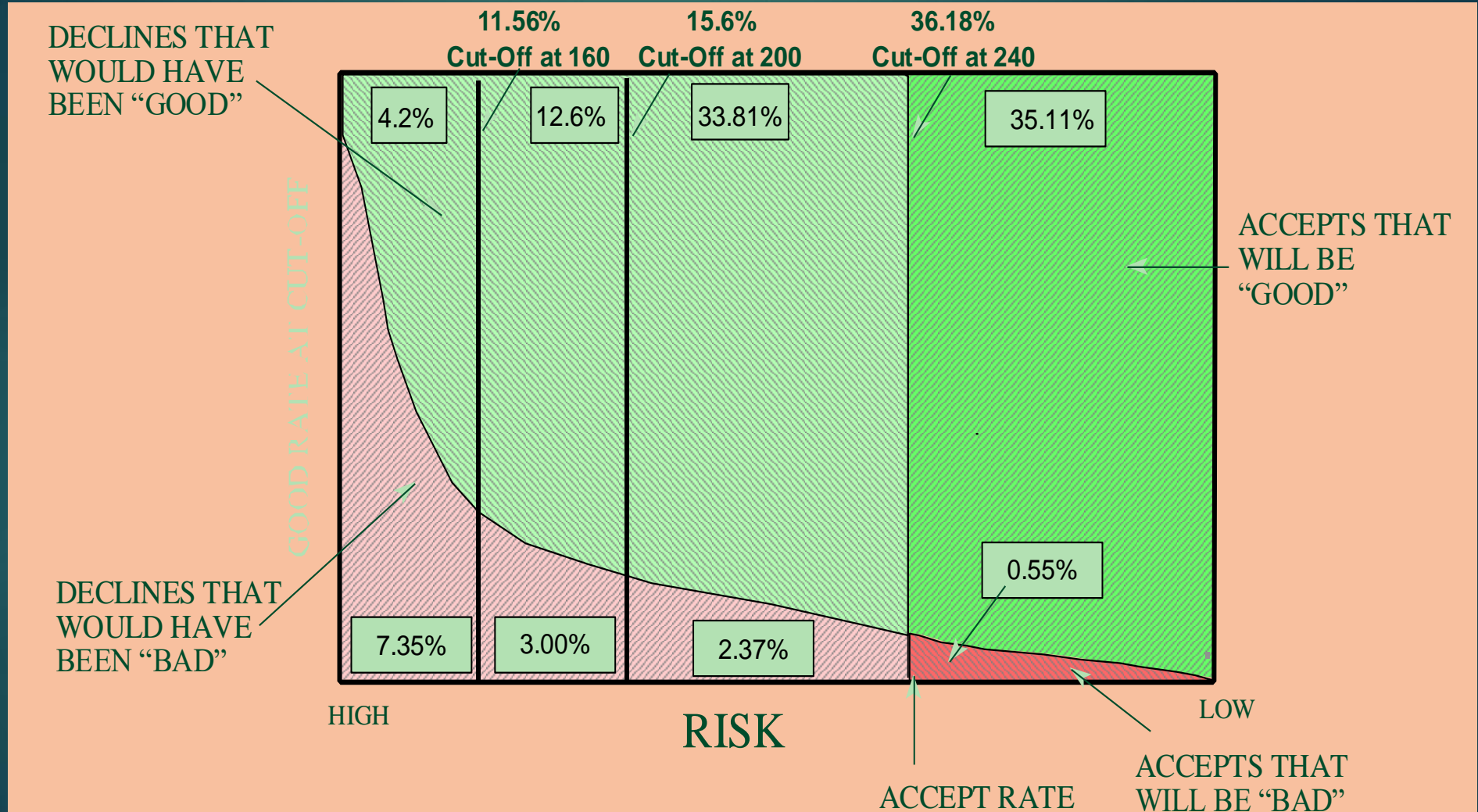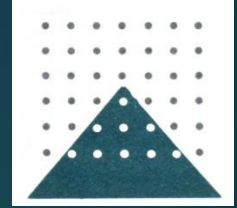*Further reduction of 25% in second year.*

11

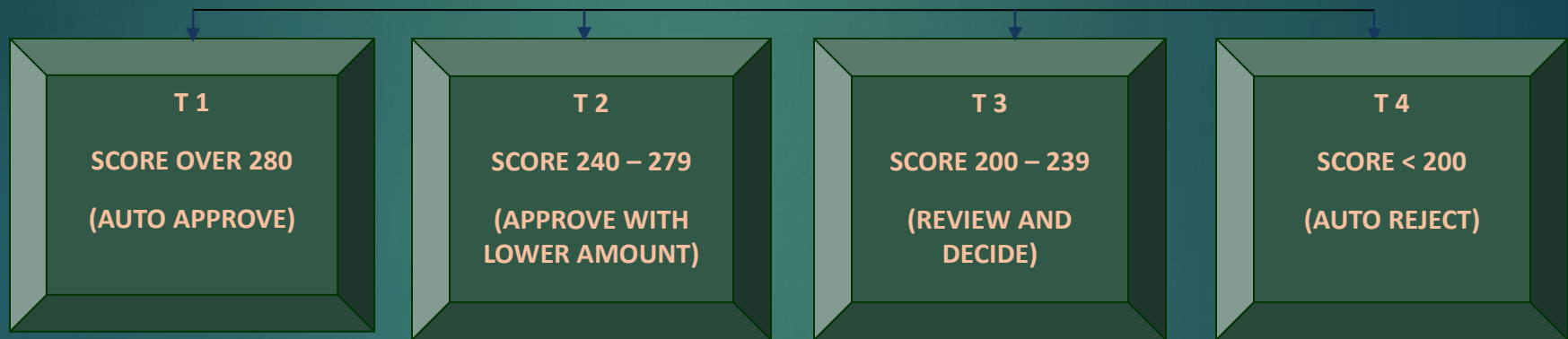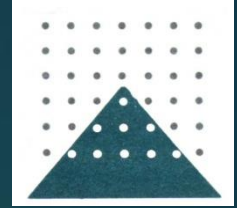# Performance Projection Table (PPT) Provided with every scorecard

Cut-off Score	Accept Rate at Cut-Off	Cumulative Accept Rate	Good/Bad Odds at Cut-off	Cumulative Good/Bad Odds of Accepts	Good/Bad Odds of Declines	Good Rate at Cut-Off	Cumulative Good Rate of Accepts	Cumulative Good Rate of Declines
310	0.50984	0.50984	362.03867	362.03867	6.49589	99.72455	99.72455	86.65936
300	**0.34353**	**0.85336**	**274.37401**	**328.34327**	**6.47068**	**99.63686**	**99.69637**	**86.61433**
290	3.23620	4.08956	174.85315	207.53771	6.23611	99.43134	99.52047	86.18042
280	4.82866	8.91822	123.63985	165.56664	5.88944	99.19769	99.39964	85.48503
270	6.47890	15.39713	87.42658	130.28378	5.43038	98.86912	99.23829	84.44882
260	4.88292	20.28005	61.81993	107.80768	5.09124	98.40815	99.08095	83.58297
250	9.40235	29.68241	43.71329	78.99219	4.44972	97.76353	98.74988	81.65045
240	**6.98096**	**36.66337**	**30.90996**	**64.67746**	**3.98094**	**96.86618**	**98.47741**	**79.92347**
230	8.91635	45.57972	21.85664	50.03311	3.39551	95.62490	98.04049	77.24949
220	10.40736	55.95708	15.45498	37.52357	2.72337	93.92281	97.40419	73.14264
210	7.61169	63.59876	10.92832	30.82409	2.22832	91.61659	96.85773	69.02418
200	**9.24559**	**72.84435**	**7.72749**	**24.00991**	**1.62085**	**88.54195**	**96.00159**	**61.84437**
190	5.85874	78.70309	5.46416	20.29370	1.22353	84.53009	95.30378	55.02654
180	4.37381	83.07690	3.86375	17.45204	0.92928	79.43971	94.58055	48.16722
170	3.49419	86.57108	2.73208	15.21173	0.69258	73.20529	93.83163	40.91853

Risk Based Pricing based on PPT

Risk Based Pricing & Rules
Example

T 1	T 2	T 3	T 4
SCORE OVER 280	SCORE 240 – 279	SCORE 200 – 239	SCORE < 200
(AUTO APPROVE)	(APPROVE WITH LOWER AMOUNT)	(REVIEW AND DECIDE)	(AUTO REJECT)

MULTIPLE TIERS CAN BE SET – ONLY 4 SHOWN IN THIS EXAMPLE

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Tiers and Rules...example

T 1

MAX LOAN AMT = $2,000

TERM = 24 MO

INTEREST = 9%

T 2

MAX LOAN AMT = $1,500

TERM = 18 MO

INTEREST = 12%

T 3

MAX LOAN AMT = $1,000

TERM = 12 MO

INTEREST = 15%

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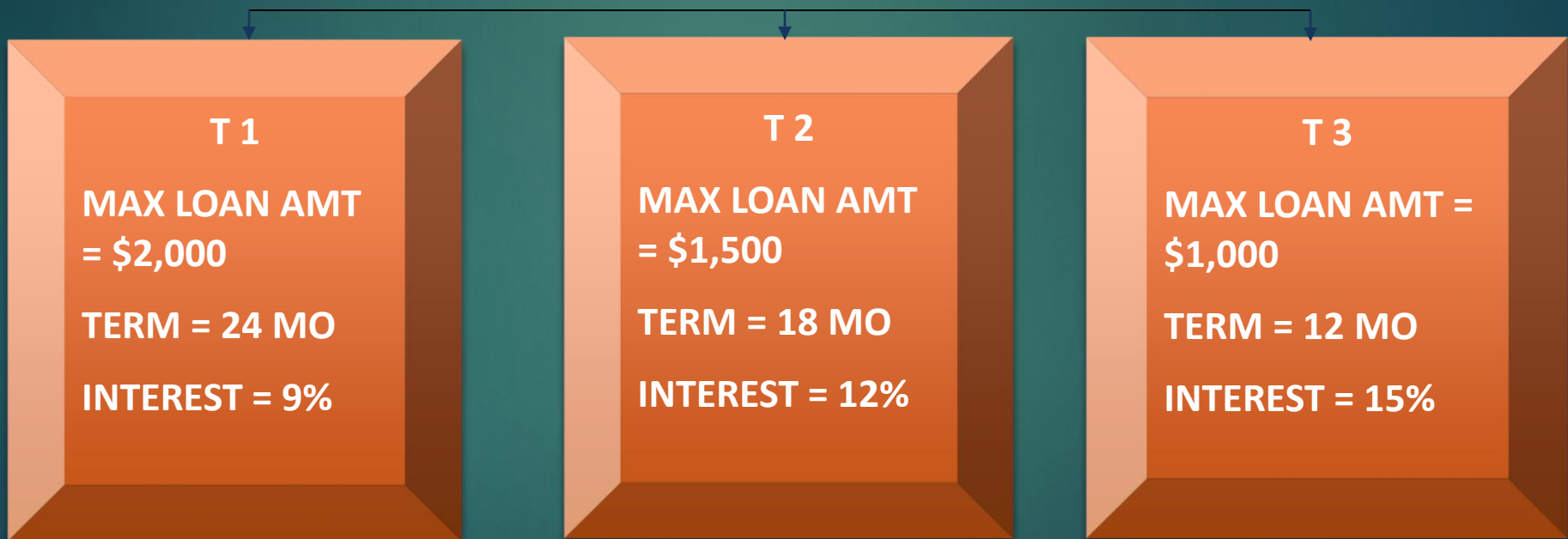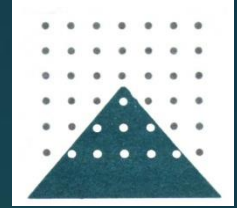
Tiers to be displayed on Loan Origination Software Screen

SCORECARD – X CBD SCORE – XXX TIER – PREFERRED	DECISION – ACCEPT/DEC RULE/S FIRED – YES/NO
RULES FIRED	5 – More than X inquiries
MAX LOAN AMT	XYZ
INTEREST RATE	XYZ
TERM	XYZ

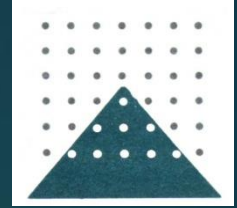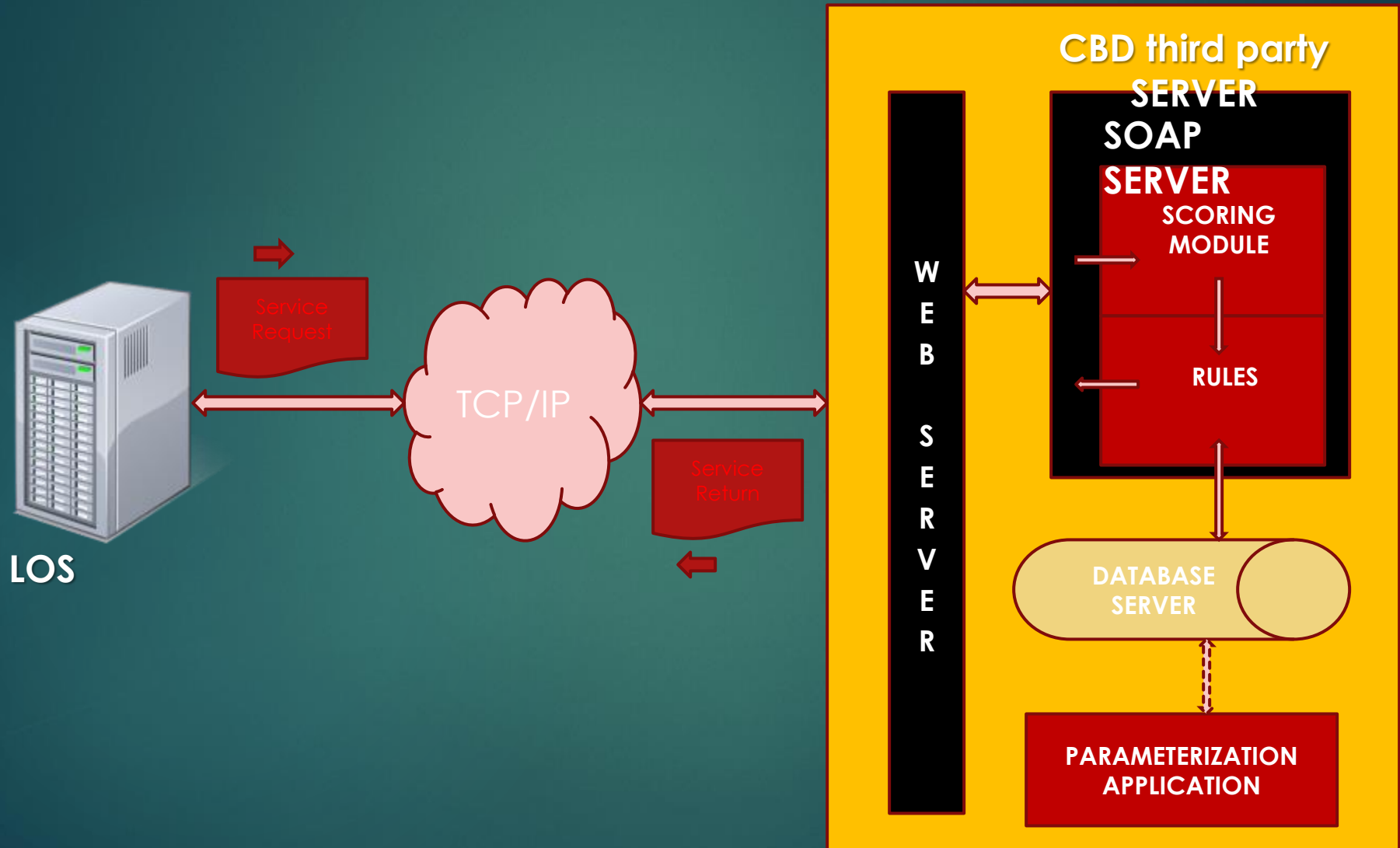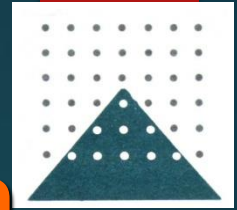| OTHER ITEMS THAT CAN BE DISPLAYED	
BUREAU MESSAGE	SSN not matching
PRODUCT	XYZ
D T I	XYZ
DISPOSABLE INCOME	XYZ

16
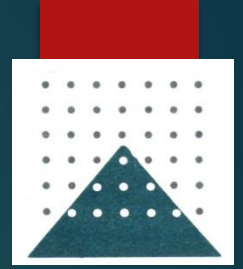
SOFTWARE OPTIONS
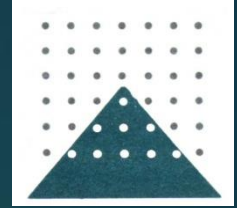
Software Implementation Options

- Provide a Scorecard through a web-service hosted on CBD secure servers using any Loan Origination System. Many LOS are already integrated with CBD

- Provide a Scorecard in a Software Module to be implemented at client's Servers or LOS's servers

- USE a CBD Loan Origination Software (DecisionStation™) for full loan application processing

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Web Service Option –
High Level Flow with Pricing option

LOS

TCP/IP

Service Request

Service Return

CBD third party
SERVER
SOAP
SERVER

WEB SERVER

SCORING MODULE

RULES

DATABASE SERVER

PARAMETERIZATION APPLICATION

Scoring Module

- Parses the raw bureau and reads the application variables

- Generates bureau characteristics and CBD Score

- Bureau characteristics for hard declines and alert messages

- The score translates into bad rate

- Clusters scores into Tiers

- Generates scorecard based decline reason codes

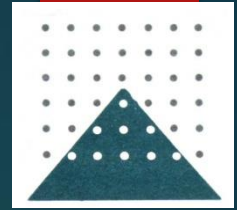- Connects database for dynamic declines, alerts and tier computations

- Logs characteristic computations and error generation

- Decision integrity with date based constraints

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Advantages of Web Service

Hosted on Independent server…no integration headaches

HTTP/(S) connection using SOAP architecture; has no bearing on the Client side platform/software

Advanced and Latest technology used… highly reliable yet no money spent on software purchase/license

Multi level logging…helps to review/audit, and build a high-end data warehouse

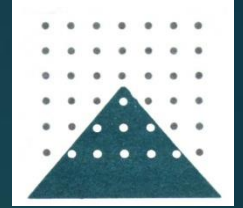Database driven…dynamically modify lending rules/policies

Auto decisions, Ad-hoc bureau rules, bureau fraud and other messages, Pricing alerts, Reason Codes (for adverse action), error messages, etc.
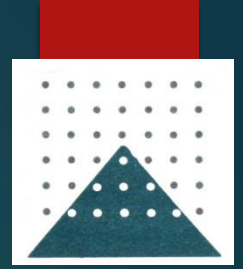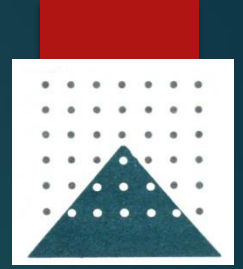
DECISION FLOW

TERMS

- **SCORECARD (Semi-Custom)**
  - **CBD Scorecard for Risk Prediction**
- **FRONT-END**
  - **Screens created by TCI for data entry, bureau pulling, display of data, display of CBD items**
- **FLOW**
  - **Flow of application based on score, forwarded to appropriate Tier by TCI**
- **DECISION**
 - **Underwriter looks at automated decision and can proceed, or override.**

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SCORECARD

INDUSTRY SPECIFIC SCORECARDS HAVE BEEN CREATED BY CBD BASED ON A HUGE SAMPLE OF HISTORICAL DATA OBTAINED OVER MANY YEARS. A SEMI CUSTOMSCORECARD OF CHOICE CAN BE DEVELOPED USING ARCHIVED DATA THAT MATCHES THE EXPECTED APPLICANT PROFILE

- A Score can be Used to Make Auto Decisions

- Score Ranges can be Used to Define Tiers (or programs) Based on Risk

- These Ranges are Picked From a Performance Projection Table that Comes with every Scorecard – Custom, or Semi-Custom.

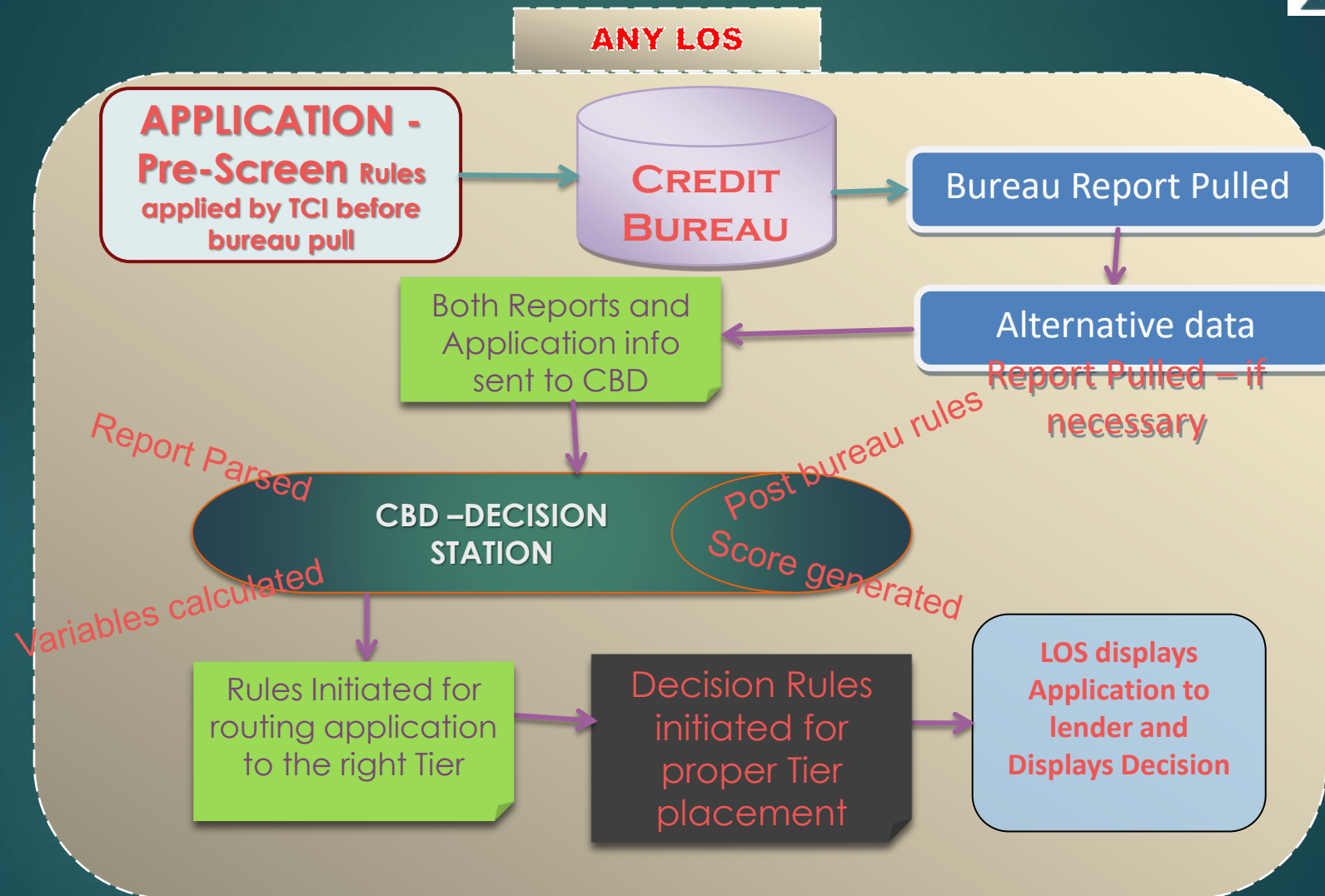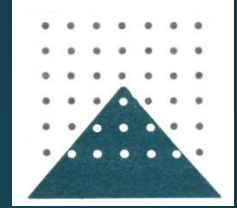- This Table Shows the Lending Risk at Each Score

FRONT END
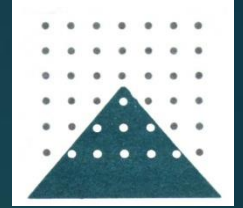
Front-end Software provided by various LOS Provides data-entry screens, bureau pulling, link with CBD and Forwards applications to appropriate TIERS based on rules, Displays rules, decisions, etc.
For example…

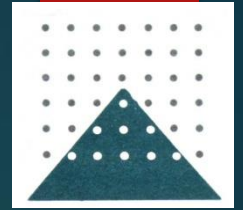| SCORECARD – X CBD SCORE – XYZ TIER – PREFERRED	DECISION – ACCEPT/DEC RULE/S FIRED – YES/NO
RULES FIRED	5 – More than X inquiries
MAX LOAN AMT	XYZ
INTEREST RATE	XYZ
TERM	XYZ
DOWN PAYMENT %	XYZ

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DECISION FLOW

ANY LOS

APPLICATION - Pre-Screen Rules applied by TCI before bureau pull

CREDIT BUREAU

Bureau Report Pulled

Both Reports and Application info sent to CBD

Alternative data Report Pulled – if necessary

Report Parsed

Variables calculated

CBD –DECISION STATION

Post bureau rules Score generated

Rules Initiated for routing application to the right Tier

Decision Rules initiated for proper Tier placement

**LOS displays Application to lender and Displays Decision**

Alternative Data Providers

CBD is integrated with Alternative Data Providers, besides all three bureaus. These providers offer risk information on people that do not have credit, or have very limited credit.

CBD is already integrated with Microbilt and LexisNexis, and have successfully used their data within the scorecards developed for clients.

ALGORITHMS
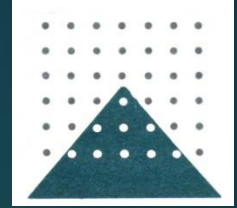
Decisions can be made using various algorithms, for example…

- **If FICO score less than X AND CBD score less than X – DECLINE (default probability high)**
- **If FICO score more than X AND CBD score more than X – APPROVE (default probability low)**
- **If FICO score more than X AND CBD score less than X – REVIEW (default probability high)**
- **If CBD score < X, then pull Microbilt report**

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RULES THAT CAN BE PROGRAMMED - EXAMPLES
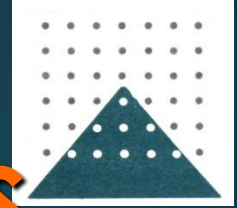
Pre Bureau Decline Rules:
1. Age < 18
2. Below minimum Income $x,xx ($x,xx joint)
3. Not gainfully employed.

Post Bureau Decline Rules:
1. SSN OR Joint SSN misused
2. No credit bureau report.
3. FICO not available OR FICO SCORE < 400
4. CBD SCORE < 200
5. More than 6 Inqs. in recent 14 days, Mort and Auto compressed
6. DTI > 65% or Disposable Monthly Income < $x,xxx
7. Disposable Monthly Income < $x,xxx then Review
8. First or second Mortgage 60 DPD
9. Bad pay after Bankruptcy Ch-7 within 3 years
10. Settled for less than full Balance

Policy and Fraud Declines
1. Income > $100,000 and Age < 26
2. Income > $180,000
3. Primary & Joint SSN are the same
4. (primary) SSN does not match bureau
5. Any trade greater than 90 DPD
6. Primary applicant's SSN issued before DOB.
7. Ch 7 bankruptcy filed last 90 and not discharged
8. Charge-off greater than $2000 excluding Medical trades

Partners and Integrations
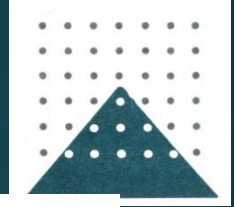
- **T C I – Loan Origination System**

- **DEFI – Loan Origination System**

- **GOLD POINT – Loan Origination System (with AR system)**

- **LAUNCHER – Loan Origination System**

- **CARLETON – Loan Origination System**

- **SMART CSC – Loan Origination System**

- **BUREAUS – All three credit bureaus (EQ, EXP, TU)**

- **MICROBILT – Alternative Data Provider**

- **LEXIS NEXIS – Alternative Data Provider**

- **POINT PREDICTIVE – Income Verification and Fraud**

- **AUTO-CLICK & IDMS – Data feeds about Autos**

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Monitoring & Recalibration
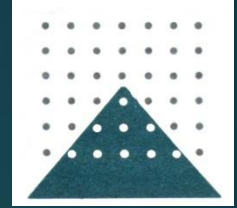
Monitoring of Scorecard performance is important for Models, particularly for semi-custom models

- The actual model must be monitored as to its performance and as to changes in population distributions, initially every 3 months and then every 6 months and the modifications made as warranted by results of statistical tests

- Results from applying the rules must also be monitored and, if necessary, these criteria may also need to be modified

CBD produces the following reports as part of Monitoring exercise….

➢ Population Distribution or Population Stability Monitoring Report

- This report shows the distribution of the applicants by score range for each model

➢ Good-Bad Population or Characteristic Analysis Monitoring Report

- This report shows the distribution of numbers of "good" and "bad" applicants by score range for each model.

Based on monitoring results, the model can be re-aligned or re-calibrated

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