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(54) SYSTEM AND METHOD FOR COLLECTIONS ON DELINQUENT FINANCIAL ACCOUNTS

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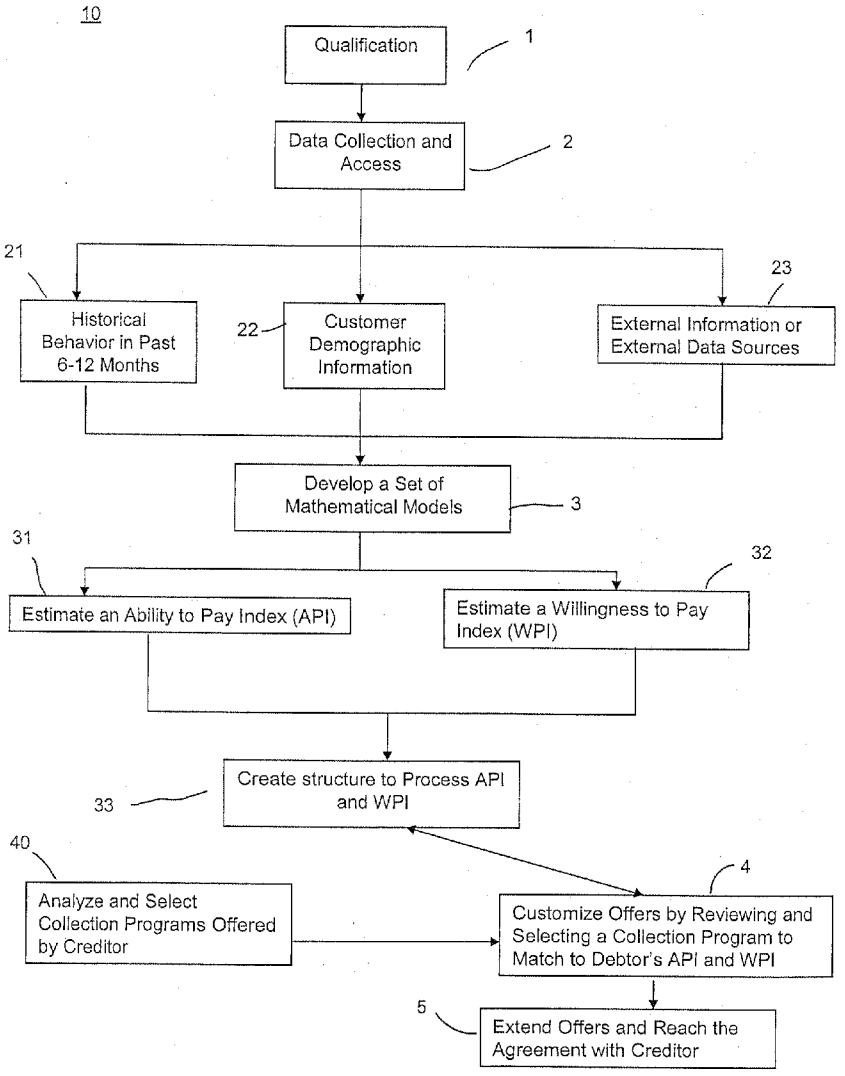
(57) **ABSTRACT**

A computer-implemented method for selecting a financial services collection program to be applied to a delinquent debtor account. First, an ability to pay index (API) is computed as a function of one or more predetermined ability to pay indicators for the debtor. Next, a willingness to pay index (WPI) is computed as a function of one or more predetermined willingness to pay indicators for the debtor. One of a plurality of predetermined collection programs to be offered to the debtor is then selected as a function of each of the API and the WPI. The WPI is computed by evaluating one or more of a past action taken by the debtor or a past status of the debtor account.



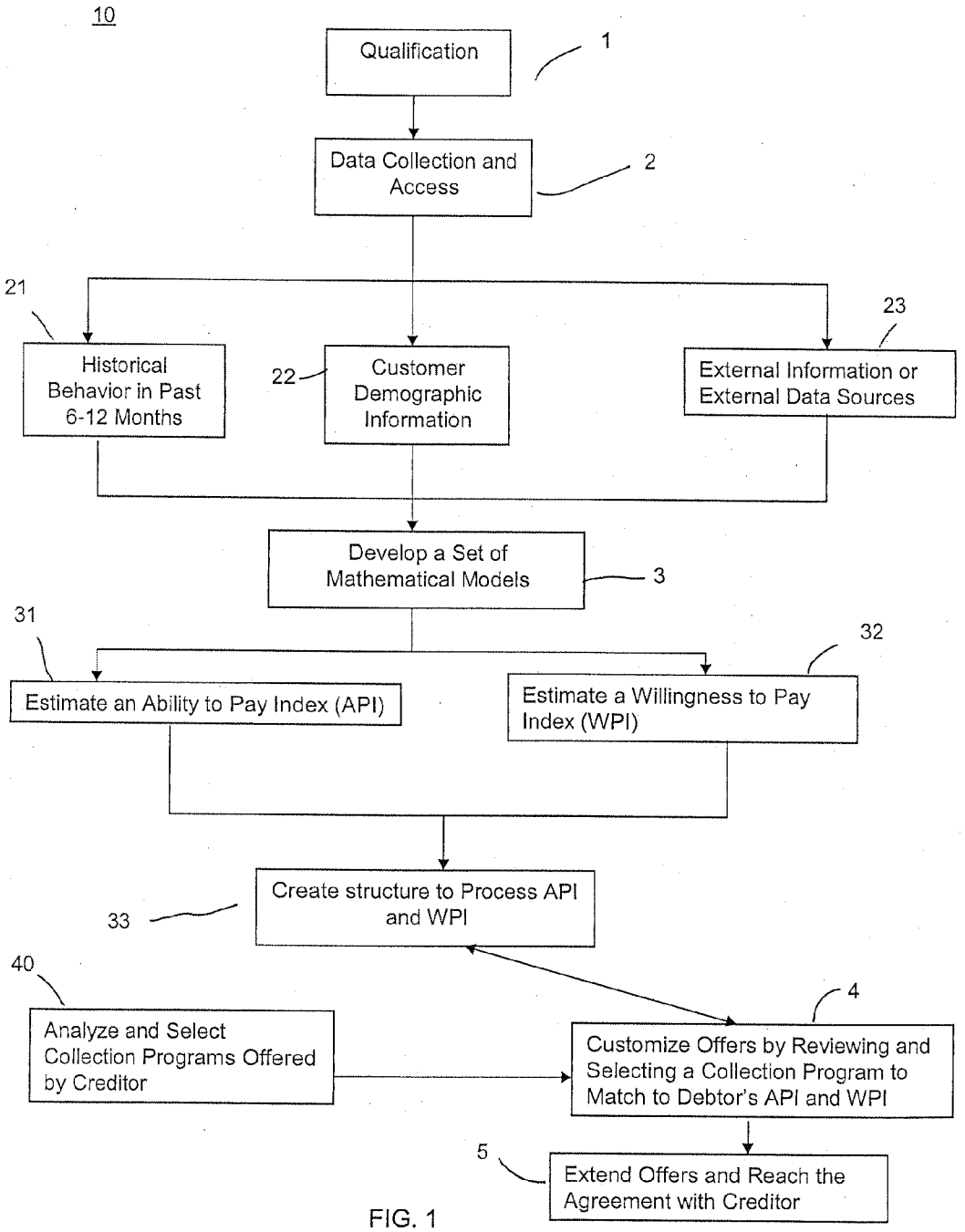

10
Qualification
1
Data Collection and Access
2
21
Historical Behavior in Past 6-12 Months
22
Customer Demographic Information
23
External Information or External Data Sources
Develop a Set of Mathematical Models
3
31
Estimate an Ability to Pay Index (API)
32
Estimate a Willingness to Pay Index (WPI)
Create structure to Process API and WPI
33
40
Analyze and Select Collection Programs Offered by Creditor
4
Customize Offers by Reviewing and Selecting a Collection Program to Match to Debtor's API and WPI
5
Extend Offers and Reach the Agreement with Creditor

FIG. 1

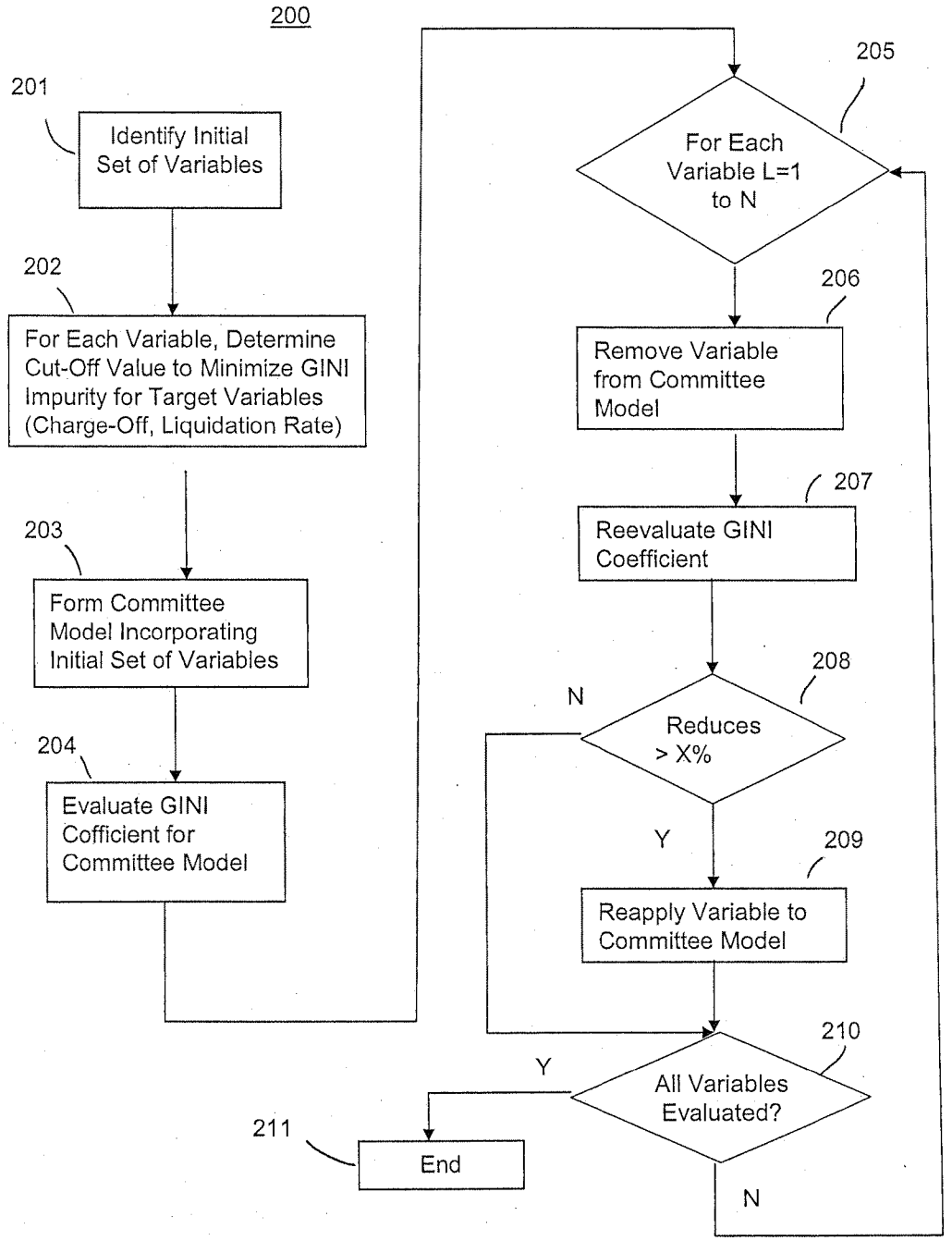

200
201
Identify Initial Set of Variables
202
For Each Variable, Determine Cut-Off Value to Minimize GINI Impurity for Target Variables (Charge-Off, Liquidation Rate)
203
Form Committee Model Incorporating Initial Set of Variables
204
Evaluate GINI Cofficient for Committee Model
205
For Each Variable L=1 to N
206
Remove Variable from Committee Model
207
Reevaluate GINI Coefficient
208
Reduces > X%
N
Y
209
Reapply Variable to Committee Model
210
All Variables Evaluated?
Y
N
211
End

FIG. 2

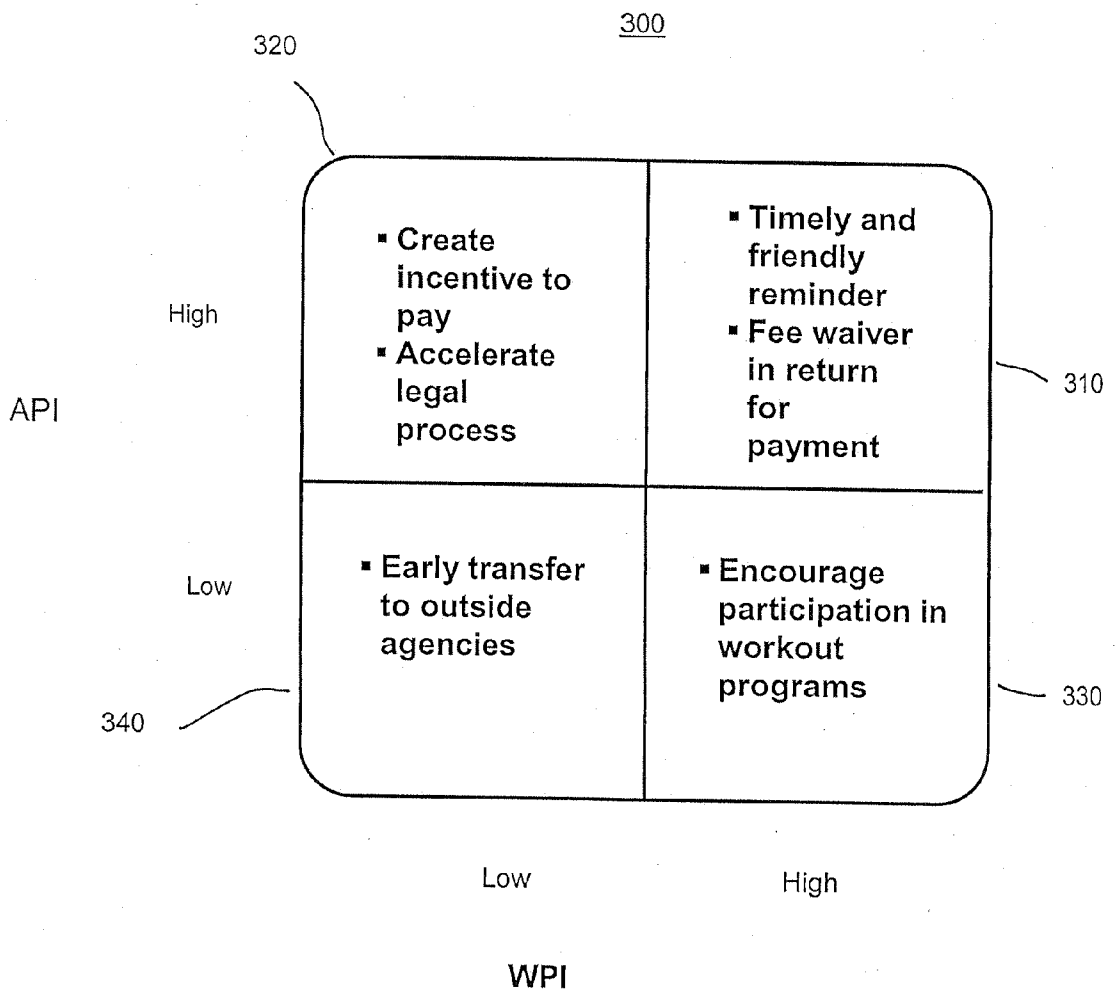
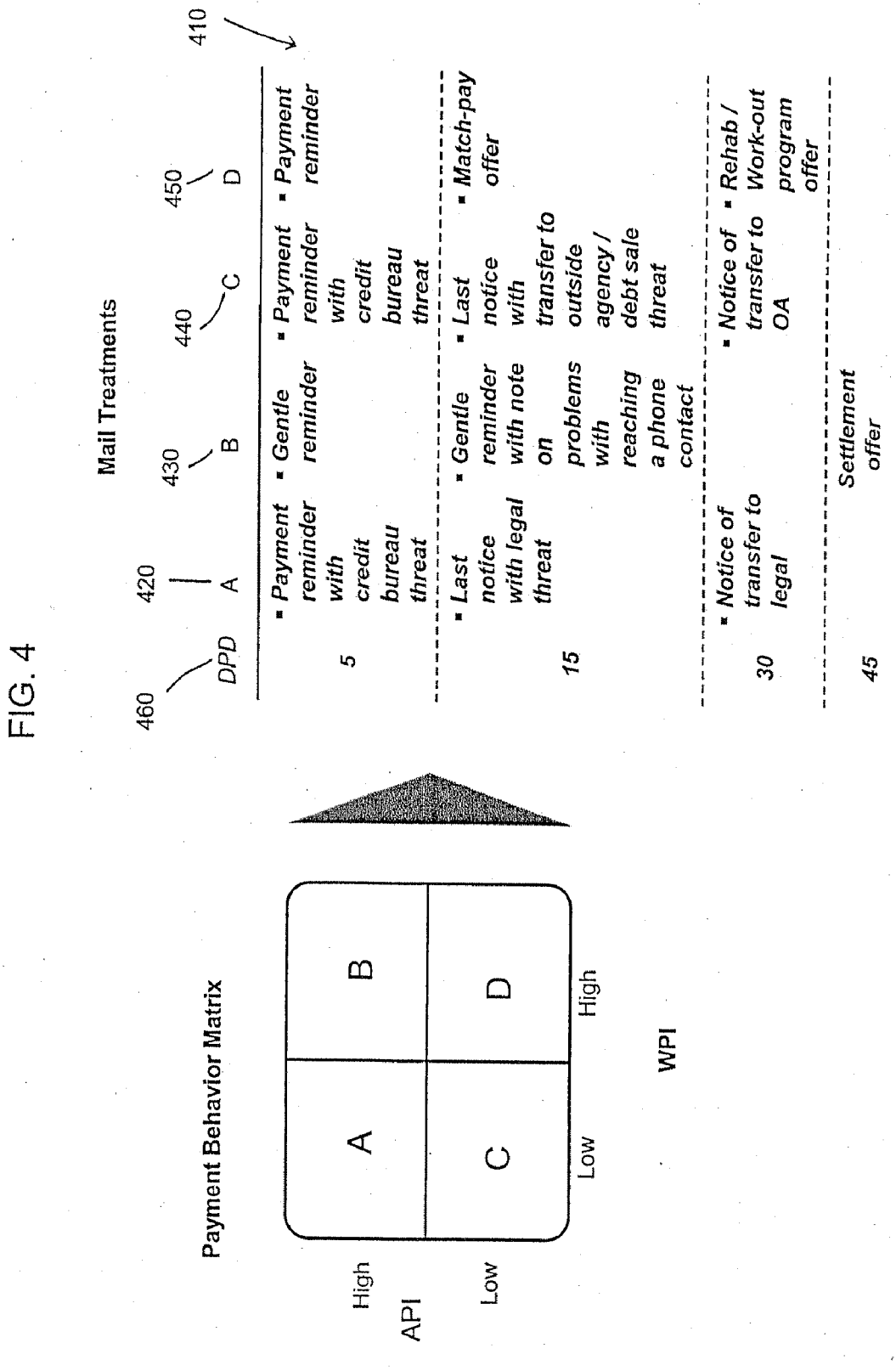

300
320
High
API
Low
340
▪ Create incentive to pay
▪ Accelerate legal process
▪ Timely and friendly reminder
▪ Fee waiver in return for payment
310
▪ Early transfer to outside agencies
▪ Encourage participation in workout programs
330
Low
High
WPI

FIG. 3

FIG. 4


Mail Treatments
460
DPD
420
A
430
B
440
C
450
D
410
Payment reminder with credit bureau threat
Gentle reminder
Payment reminder with credit bureau threat
Payment reminder
Last notice with legal threat
Gentle reminder with note on problems with reaching a phone contact
Last notice with transfer to outside agency / debt sale threat
Match-pay offer
Notice of transfer to legal
Notice of transfer to OA
Rehab / Work-out program offer
Settlement offer
Payment Behavior Matrix
A
B
C
D
High
Low
API
High
Low
WPI

Customer Segment	High API High WPI	High API Low WPI	Low API High WPI	Low API Low WPI
Call Strategy	Anchor high and collect entire delinquent amount without using treatment plan. Deepen relationship with customer	Build rapport with customer by listening and asking exploratory questions. Talk to customer about consequences of not paying	Collect a minimum payment from customer to prevent from rolling to next bucket. Offer customer treatment that lowers monthly payment	Minimize time on the phone. Focus conversation on consequences of not paying, such as legal action and credit bureau reporting
Sales Closing Techniques	Assumptive close: Act as if the customer has made the decision to pay by asking how and when they can pay	Conditional close: When the customer offers an objection, make payment condition of resolving their objection	Time sensitive close: Emphasize why now is the best time to pay	Testimonial close: Provide evidence that other people like the customer are agreeing to a payment program
Key Principles of Influence	Likability: Find similarities between you and the customer and bring them to the surface	Reciprocation: Create obligation by helping customer	Scarcity: Reveal to customer that offer may be difficult to obtain in the future	Authority: Increase customer's perception of you as an authority by providing details about your background
Suggested Treatments	Fee waiver in return for payment	Fee waiver or APR reduction in return for payment	Work-out program or settlement	
Consequences of Not Paying	None. Maintain relationship so customer will accept next call	Refer to legal stream		

FIG. 5

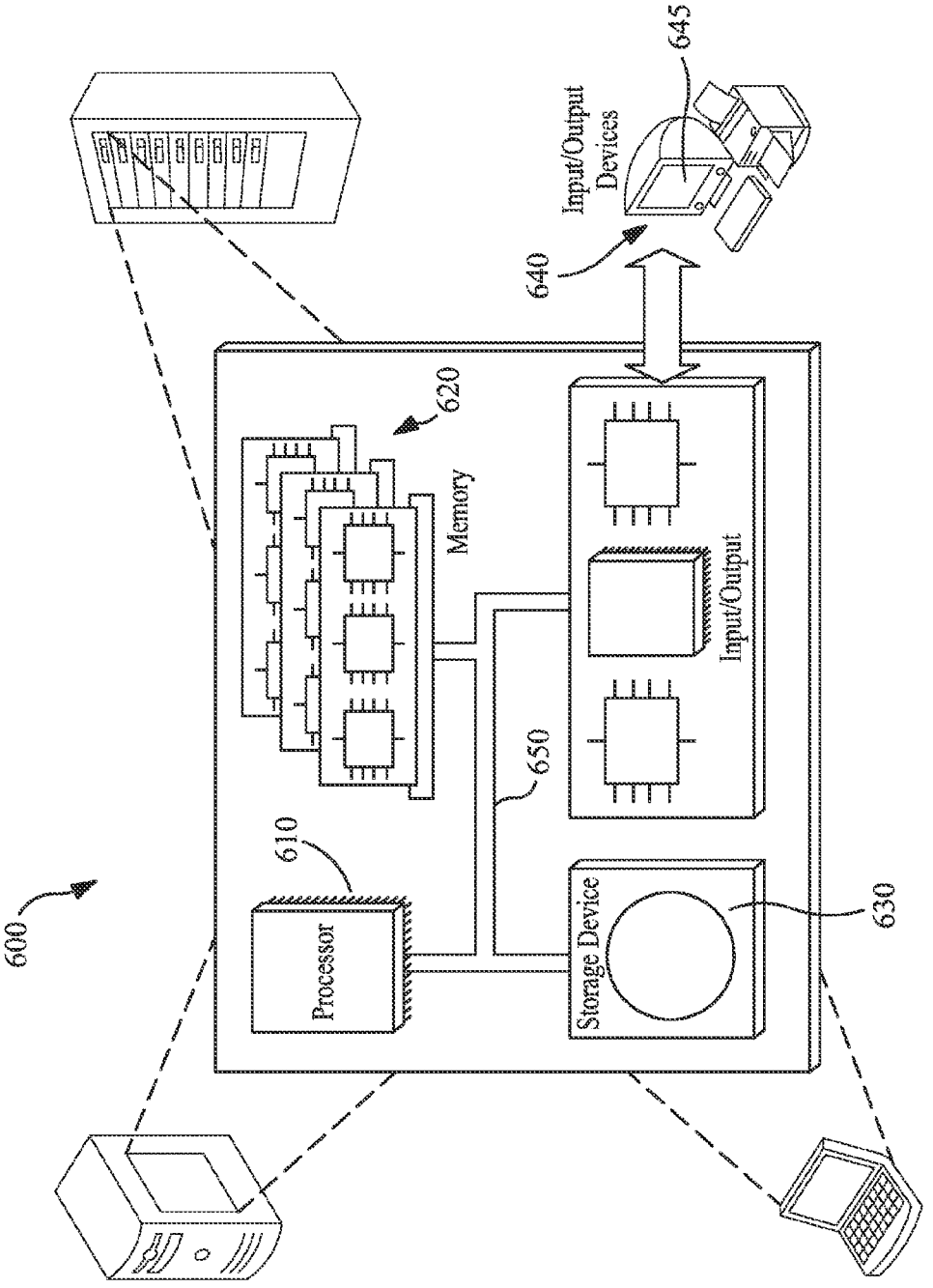

645
Input/Output Devices
640
620
Memory
Input/Output
650
610
Processor
Storage Device
630
600

FIG. 6

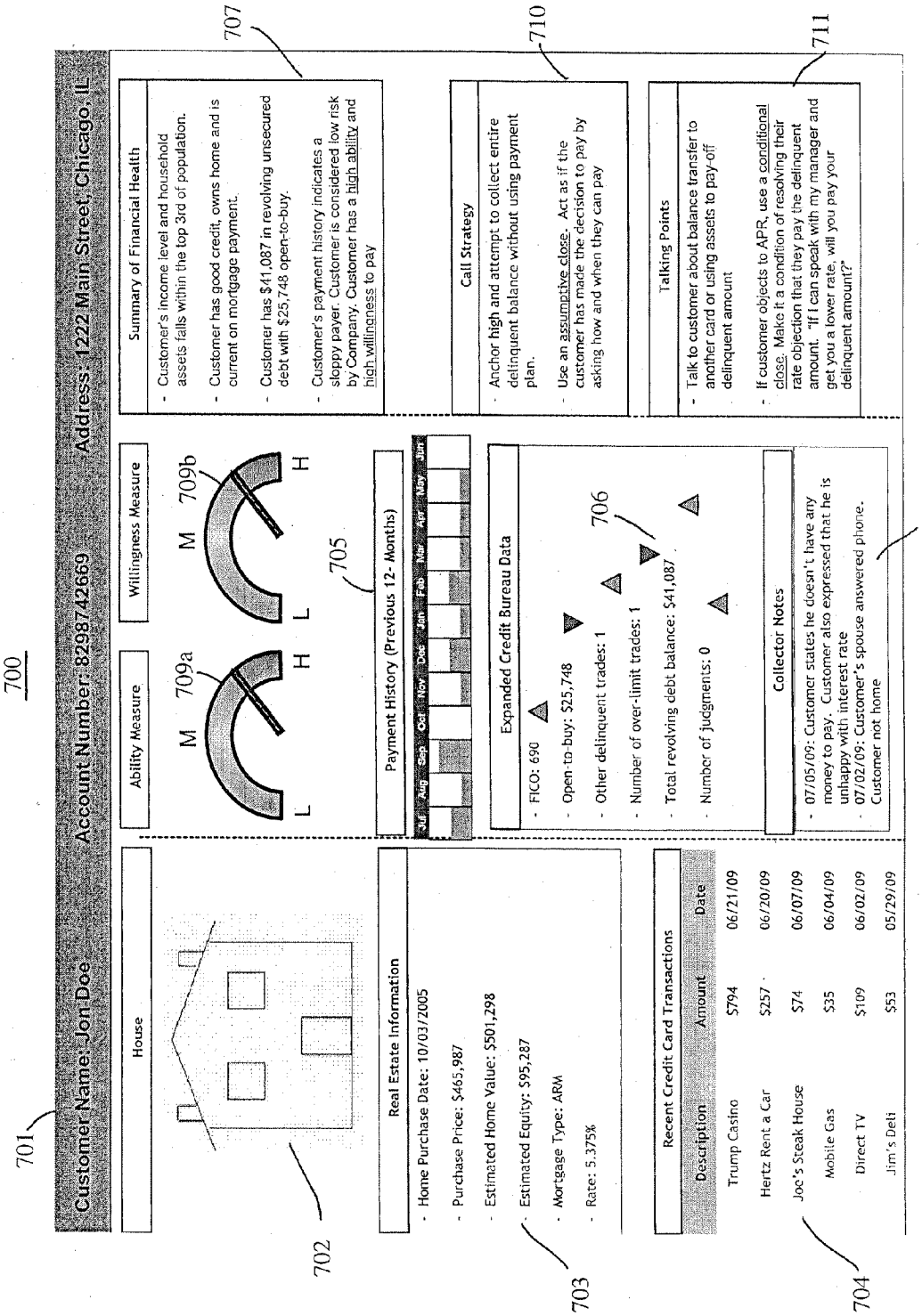

700
701
Customer Name: Jon Doe
Account Number: 8298742669
Address: 1222 Main Street, Chicago, IL
House
Ability Measure
Willingness Measure
Summary of Financial Health
Customer's income level and household assets falls within the top 3rd of population.
Customer has good credit, owns home and is current on mortgage payment.
Customer has $41,087 in revolving unsecured debt with $25,748 open-to-buy.
Customer's payment history indicates a sloppy payer. Customer is considered low risk by Company. Customer has a high ability and high willingness to pay
707
M 709a
L H
M 709b
L H
705
Payment History (Previous 12- Months)
Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
Call Strategy
Anchor high and attempt to collect entire delinquent balance without using payment plan.
Use an assumptive close. Act as if the customer has made the decision to pay by asking how and when they can pay
710
Real Estate Information
Home Purchase Date: 10/03/2005
Purchase Price: $465,987
Estimated Home Value: $501,298
Estimated Equity: $95,287
Mortgage Type: ARM
Rate: 5.375%
Expanded Credit Bureau Data
FICO: 690
Open-to-buy: $25,748
Other delinquent trades: 1
Number of over-limit trades: 1
Total revolving debt balance: $41,087
Number of judgments: 0
706
Talking Points
Talk to customer about balance transfer to another card or using assets to pay-off delinquent amount
If customer objects to APR, use a conditional close. Make it a condition of resolving their rate objection that they pay the delinquent amount. "If I can speak with my manager and get you a lower rate, will you pay your delinquent amount?"
711
Recent Credit Card Transactions
Description Amount Date
Trump Casino $794 06/21/09
Hertz Rent a Car $257 06/20/09
Joe's Steak House $74 06/07/09
Mobile Gas $35 06/04/09
Direct TV $109 06/02/09
Jim's Deli $53 05/29/09
Collector Notes
07/05/09: Customer states he doesn't have any money to pay. Customer also expressed that he is unhappy with interest rate
07/02/09: Customer's spouse answered phone. Customer not home
702
703
704
708

FIG. 7

SYSTEM AND METHOD FOR COLLECTIONS ON DELINQUENT FINANCIAL ACCOUNTS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is related to, incorporates by reference and claims the priority benefit of U.S. Provisional Application 61/176,445, filed May 7, 2009 and entitled "A Willingness and Affordability Decision Engine to improve collection efficiency in retail financial services."

FIELD OF THE INVENTION

[0002] The present application is directed to a system and method for determining a collection treatment for delinquent accounts, and more particularly, to a system and method for selecting a collection treatment based on an estimate of affordability to the debtor and an estimate of the debtor's willingness to pay.

BACKGROUND OF THE INVENTION

[0003] Financial services companies ("creditors") often design collection strategies for delinquent accounts based on proprietary risk assessment models. A typical proprietary risk assessment model, for example, will generate a risk score that estimates a likelihood that the account will be cured, or a likelihood that the account will remain uncured and require a charge-off of the uncollected debt. Collections efforts against debtors may then be prioritized according to the risk probabilities reflected in the generated risk scores.

[0004] For example, a financial services company may divide delinquent accounts into high-, medium-, and low-risk groups according to their risk scores. Accounts that are in the low-risk group may initially be given very light collection treatment (such as sending the debtor a reminder letter), followed by a phone call if payment has not arrived within a fixed time after the letter is sent. Accounts in the medium-risk group may receive a more intensive collection treatment including repeated direct communication with the debtor to secure a payment or to start a pay-down program. Accounts in the high-risk group may be designated for settlement (typically for less than 100% payment), or be designated for legal action to affect collections.

[0005] One short-coming of a risk-only based collection analysis based on a proprietary risk assessment model is that it does not specifically suggest what level of pay-down program or settlement is appropriate based upon a debtor's ability to pay, and does not predict whether or not the debtor will stick to the agreed-upon payment program.

[0006] Although many data aggregator companies collect financial information about consumers (including information about income, assets, and major expenses such as mortgage and car loans), this information is often incomplete and inaccurate. For example, while credit bureaus may collect information about consumer income and loans (e.g., mortgage loans, car loans, and other type of loans), these bureaus typically do not collect accurate consumer investment and asset information. Although more accurate income and investment data may be collected from another data aggregator, related information collected by the data aggregator and the credit bureau may be inconsistent and therefore difficult to resolve.

[0007] As a result, it would be desirable to develop a method using these multiple and varied pieces of income information to form a more reasonable understanding of a debtor's ability to pay for the purpose of forming a debt collection strategy.

SUMMARY OF THE INVENTION

[0008] The inventors of the present invention have advantageously become aware that debtors of modest financial means may in some cases be more likely to honor a debt payment agreement than other debtors having greater financial means In other words, a willingness of the debtor to repay a debt may not be fully correlated with that debtor's ability to repay the debt. To date, willingness has been difficult to define and measure. As a result, the present invention incorporates a method to estimate a debtor's willingness to repay a debt, and to use this additional information in conjunction with an improved estimate of the debtor's ability to pay to form an effective debt collection strategy.

[0009] The present invention is directed to a system and method for selecting a financial services collection program to be applied to a debtor account. The collection program, alternatively referred to as a collection strategy, defines a series of actions to be taken by the creditor in order to address a debtor's delinquency in making scheduled payments directed to the account (including for example, such activities as writing to the debtor, calling the debtor, and preparing a settlement offer to settle the account) The invention incorporates models for computing an ability to pay index (API) as a function of one or more predetermined ability to pay indicators for the debtor, and models for computing a willingness to pay index (WPI) as a function of one or more predetermined willingness to pay indicators for the debtor. The invention enables one of a plurality of predetermined collection programs to be selected as a function of the API and the WPI for offer to the debtor. By assessing both the debtor's ability to pay in the form of the API and the debtor's willingness to pay in the form of the WPI, and using this information to select an appropriate collection program, the rate of acceptance of offers by debtors and the performance of accepted programs can be improved.

[0010] Each of the API and the WPI are preferably modeled as a function of one predetermined variables, which may for example be transformed into binary variables and linearly combined with equal weights to form a committee model. Based on historical data for a collection of debtor accounts, a cut-off value is selected for each binary variable that enables the committee model to distinguish a high charge-off rate sub-population in the historical data from a low charge-off rate sub-population in the data, and to distinguish a high liquidation rate sub-population in the data from a low liquidation rare sub-population in the data (for example, through conventional classification and regression tree analysis). In this manner, the API and WPI can be used to predict a high and low ability to pay and a high or low willingness to pay, respectively, for a debtor that is delinquent with respect to a current account.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The invention will become more readily apparent from the Detailed Description of the Invention, which proceeds with reference to the drawings, in which:

[0012] FIG. **1** shows a flow diagram illustrating an exemplary method for developing an account collections program according to the present invention;

[0013] FIG. **2** shows a flow diagram illustrating an exemplary method for selecting binary variables and cut-off values for a model to calculate an Ability to Pay Index (API);

[0014] FIG. **3** illustrates characteristics of an exemplary collections strategy based the API and on a Willingness to Pay Index (WPI), in accordance with principles of the present invention;

[0015] FIG. **4** illustrates an exemplary collections plan according to the collections strategy of FIG. **3**, based on differentiated mail treatments;

[0016] FIG. **5** illustrates an exemplary collections plan according to the collections strategy of FIG. **3**, based on telephone contact;

[0017] FIG. **6** shows a schematic diagram depicting a server computer suitable for implementing the exemplary method of FIG. **1**; and

[0018] FIG. **7** illustrates an exemplary computer screen design for presenting API, WPI and collections plan information to a creditor.

DETAILED DESCRIPTION OF THE INVENTION

[0019] Reference will now be made in detail to exemplary embodiments of the invention, including the best modes contemplated by the inventors for carrying out the invention. Examples of these exemplary embodiments are illustrated in the accompanying drawings. While the invention is described in conjunction with these embodiments, it will be understood that it is not intended to limit the invention to the described embodiments. Rather, the invention is also intended to cover alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims. In the following description, specific details are set forth in order to provide a thorough understanding of the present invention. The present invention may be practiced without some or all of these specific details. In other instances, well-known aspects have not been described in detail in order not to unnecessarily obscure the present invention.

[0020] In this specification and the appended claims, the singular forms "a," "an," and "the" include plural references unless the context clearly dictates otherwise. Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood to one of ordinary skill in the art to which this invention belongs.

[0021] Method for Developing an Account Collections Strategy

[0022] FIG. **1** shows a flow diagram **10** illustrating an exemplary method according to the present invention for developing an account collections strategy by estimating both a debtor's ability to pay and the debtor willingness to pay. The method **10** is particularly suitable for being implemented on the computer system **400** depicted in FIG. **6**.

[0023] Referring to the method **10** in FIG. **1**, at step **1**, an analysis of the debtor's account is performed to determine whether the account is qualified to receive a collections treatment according to a predetermined rule. For example, the predetermined rule may provide that a collections treatment is triggered after a selected number of days past due (DPD) have accumulated after a payment due date on which no payment was received from the debtor.

[0024] Then in step **2**, a data collection profile is established for collecting the data necessary for determining an Ability to Pay Index (API) and Willingness to Pay Index (WPI). The data collection profile may be selected, for example, based on debtor demographic information (step **22**), the debtor's historical payment behavior (step **21**), and/or data from other third party sources (step **23**). An exemplary data collection profile is further described herein.

[0025] At step **3**, mathematical models are used to produce the API for the debtor and an estimate of the debtor's free disposable cash for debt payment as recited in step **31**, and for producing the WPI for the debtor as recited in step **32**. Then, in step **33**, the API and WPI are applied to select a payment program according to a payment behavior model. Exemplary models for the API, WPI and payment behavior are further described herein.

[0026] A representative set of available collection plans ("payment programs") to be evaluated may be received, for example, a creditor (for example, a credit card issuer) as indicated in step **40**. Actions taken by the creditor (or on behalf of the creditor by another collector) in accordance with exemplary payment programs may include, for example, an initial "friendly" reminder to the debtor to make payment without penalties or other sanctions, an attractive settlement that increases the debtor's incentives to pay, and/or the initiation of a legal process for collections.

[0027] At step **4**, the payment programs are evaluated in relation to API and WPI. Specifically, one of the available payment programs is selected as a preferred or best match in view of the API and WPI, and in view debtor's free disposable cash for debt payment. An exemplary selection process in accordance with the present invention is further described with reference to FIGS. **3-5**. At step **5**, the selected plan is presented to the debtor as a proposed collection offer.

[0028] API Computation

[0029] Table I illustrates an exemplary gap distribution for historical debt settlement offers which were not accepted by debtors, and thus which resulted in charge-offs by the creditors ("Charged-Off Accounts"). In this case, the gap percentage shown in Table I represents the difference between an estimated affordable settlement rate and a settlement rate that was actually offered to the debtor. The affordable settlement rate is determined, for example, as an estimate of the ratio of the debtor's annual estimated dispensable income to the total debt amount.

TABLE I

	Charged-Off Account	
Gap	% of Total Charged-Off Account	Average_Risk_Score
−40%−	33%	7,877.5
−30%	12%	8,581.8
−20%	9%	8,516.9
−10%	7%	8,501.4
−10%~+10%	9%	8,417.1
+10%	4%	8,315.4
+20%	3%	8,331.7
+30%+	23%	7,026.4
Grand Total	100%	7,995.6

TABLE II

Settled Account	
Avg Gap	% of Total Settled Account
−47%−	10%
−34%	10%
−23%	10%
−10%	10%
−10%~+10%	10%
+10%	5%
+20%	5%
+30%+	40%
Grand Total	100%

[0030] Table II complements Table I by illustrating an exemplary gap distribution for debt settlement offers which were accepted by debtors ("Settled Accounts"). Once again, the gap percentage is estimated as the ratio of the debtor's annual estimated dispensable income to the total debt amount.

[0031] With reference to Table I, it can be seen that the magnitude of the gap is correlated with a relative percentage of the accounts that are charged off ("% of Total Charged-Off Accounts"). In sharp contrast, the corresponding risk score calculated by using the proprietary risk assessment model of an associated creditor ("Average Risk Score) shows almost no correlation with the magnitude of the gap.

[0032] When comparing Tables I and II one can see that the charged-off accounts of Table I are dominated by accounts with negative gaps (for example, totaling at least 61% of all accounts), while the settled accounts of Table II have negative gaps for only about 40% of all accounts. As negative gaps represent an indication of a debtor's apparent inability to pay, the historical data suggests that collections efficiency may be increased by estimating API.

[0033] Because a debtor can potentially draw payment resources from many different sources (for example, including regular income, savings, income from investments, and the like), it is necessary to consider a number of different information sources in order effectively estimate API. In a preferred embodiment of the present invention, information is collected from credit bureaus, from other third party data aggregators, and from the creditor, and an API is produces, for example, in consideration of all creditor accounts that are 30 days past due (DPD), with the intention of offering appropriate payment programs and/or settlement programs for those past-due accounts that are predicted to be at high risk of being charged off.

[0034] Table III lists exemplary variables and data sources to be used in computing the API:

TABLE III

Variable	Description	Source
V1_Income	Income	3rd party data
V2_All_asset	Value of assets per household	3rd party data
V4_Fix_Incm_Asst	Fixed income assets per household	3rd party data
V5_DC_Asst	Value of deposits and cash per household	3rd party data
V6_CPT	Capacity to pay	Creditor data
V7_DSI	Disposable income score	Creditor data
V8_PVLV_OTB	Total open-to-buy on all revolving bankcards[1]	Credit bureau data
V9_MP	Mortgage payment	Credit bureau data
V10_ALP	Auto loan payment	Credit bureau data
V11_TCCD	Total credit card debt	Credit bureau data

[1]In Table III, the variable "Total open-to-buy on all revolving bankcards" is computed as the total credit amount (limit) of all revolving bankcards less the total balance of all revolving bankcards.

[0035] In accordance with an exemplary aspect of the present invention, each variable to be used in modeling the API is transformed into a binary variable. A "cut-off value" for making a binary value determination (i.e., "0" or "1") is selected to maximize the separation between a high charge-off rate sub-population and a low charge-off rate sub-population, and also to separate high and low liquidation rate sub-populations. FIG. **2** shows a flow diagram **200** illustrating an exemplary method for selecting the binary variables and cut-off values.

[0036] Referring to flow diagram **200**, at step **201**, each of the variety of data sources is examined to determine an initial set of binary variables to be considered for the API model (for example, the exemplary variables listed in Table III). At step **202**, a cut-off value is computed for each variable in the initial set according to its ability to separate or discriminate the high charge-off rate sub-population from the low charge-off rate sub-population and the high liquidation rate sub-population from the low liquidation rate sub-population. For example, in a preferred embodiment of the present invention, the cut-off value for each variable is independently computed to be a value that minimizes the "GINI impurity" value for each of the target variables (e.g., charge-off and liquidation rate). As used herein, the GINI impurity is a measure of how often a randomly chosen element from the population of data would be incorrectly labelled if it were randomly labelled according to the distribution of labels in the sub-population. The GINI impurity can be computed, for example, by summing the probability of each item being chosen times the probability of a mistake in categorizing that item. This step **202** operates in effect to build a one-variable, single-split Classification and Regression Tree (CART) model. Known methods for calculating the GINI impurity are described, for example, in Breiman et al., *Classification and regression trees*, Monterey, Calif.: Wadsworth & Brooks/Cole Advanced Books & Software, 1984, which is incorporated by reference herein in its entirety.

[0037] After the cut-off values are calculated in step **202**, the binary variables are preferably combined to form a linear committee model in which all of the variables are represented with equal weights in step **203**. This model is particularly appropriate when the data used for calculating the cut-off values has significant noise (i.e., is "unclean"). For "clean" data, an ensemble model with optimized weights can be used in place of the committee model. Ensemble models are described, for example, in Opitz et al., "Popular ensemble methods: An empirical study". *Journal of Artificial Intelligence Research* 11: 169-198, 1999, which is incorporated by reference herein in its entirety.

[0038] Using the committee model formed at step **203**, a "GINI coefficient" is computed for the model at step **204**. The GINI coefficient is used to estimate the discriminatory power of the model, and is defined to have a value equal to twice the

value of an area between a "line of equality" (i.e., a line representing the target value as being constant and independent of the values of the variables in the model) and a Lorenz curve (i.e., a curve for which the target value depends on the values of the variables in the model). Known methods for determining GINI coefficients in like models are described, for example, in more detail in Gastwirth, Joseph L. (1972). "The Estimation of the Lorenz Curve and Gini Index". *The Review of Economics and Statistics* 54: 306-316, 1972, which is incorporated by reference herein in its entirety.

[0039] Then, beginning at step **205**, the contribution of each binary variable to the discriminatory power of the model is evaluated. At step **206**, a first one of the binary variables is removed from the model and the GINI coefficient is re-evaluated. At step **208**, if the GINI coefficient decreases by more than X % (for example, 10%), the variable is determined to discriminate and is reapplied to the committee model at step **209**. If the GINI coefficient decreases by less than X %, the variable is determined to be non-discriminatory and remains removed from the model. At step **510**, the evaluation process continues to repeat steps **205-209** until each binary variable has been evaluated, at which point the process concludes at step **211**.

[0040] Alternatively, other variable selection methods, such as Minimum Redundancy Maximum Relevance (mRMR), may be employed in accordance with the present invention. Suitable mRMR techniques are described, for exampler, in Peng et al., "Feature Selection Based on Mutual Information: Criteria of Max-Dependency, Max-Relevance and Min-Redundancy". *IEEE Transactions of Pattern Analysis and Machine Intelligence,* 27, 8: 1226-1238, 2005, which is incorporated by reference herein in its entirety.

[0041] In the present example, it was found that three variables could be dropped without reducing the model's discrimination power:

[0042] V9_MP,

[0043] V10_ALP, and

[0044] V11_TCCD.

[0045] It should be noted that, in accordance with other examples using other data sets, these three variables may be required to be maintained while other variables may be suitably dropped

[0046] Thus, in the present example, and in accordance with exemplary method **200** described in conjunction with FIG. **2**, an API was developed including the following variables and cut-values:

$$API=V1\_Income+V2\_All\_Asset+V4\_Fix\_Incm\_Asst+V5\_DC\_Asst+V6\_CTP+V7\_DSI+V8\_PVLV\_OTB \quad [1]$$

where:

[0047] if income<=$88,636 then V1_income=0; else V1_Income=1;

[0048] if value of asset per household<=$81,863 then V2_All_Asset=0; else V2_All_Asset=1;

[0049] if fixed income asset per household<=$34,930 then V4_Fix_Incm_Asst=0; else V4_Fix_Incm_Asst=1;

[0050] if value of deposit and cash per household<=$23,198 then V5_DC_Asst=0; else V5_DC_Asst=1;

[0051] if capacity to pay<=$16,974 then V6_CTP=0; else V6_CTP=1;

[0052] if disposable income score<=329 then V7_DSI=0; else V7_DSI=1;

[0053] if total open-to-buy on revolving bankcard<=$9,169 then V8_RVLV_OTB=0; else V8_RVLV_OTB=1;

[0054] Table IV illustrates several characteristics of the API calculated according to the above model based on historical data. Delinquent accounts classified having a "high" API (i.e., values of 4-7), which comprise 27% of the population (% Accum. Pop), received an average payment ("Avg Payment") is 71% higher than average payments made for accounts having low API (i.e., values of 0-4). Average liquidation rates for the high API accounts are approximately 33% higher than average rates for low ability accounts, and average charge-off rates ("CO rate") for high API accounts are approximately 88% lower than average CO rates for low API accounts. Finally, the average percentage of payments that were at least 90 days delinquent ("Hit 90DPD Rate") is approximately 45% lower for high API accounts as compared to low API accounts.

TABLE IV

Ability to Pay Index	% Pop	% Accum. Pop	Avg Payment	Liquidation Rate	Hit 90DPD Rate	CO Rate
7	5%	5%	$1,098	37%	4%	3%
6	6%	12%	$ 937	33%	7%	5%
5	6%	18%	$ 732	30%	9%	7%
4	9%	27%	$ 736	28%	10%	8%
3	12%	39%	$ 681	25%	13%	10%
2	16%	56%	$ 586	24%	15%	11%
1	22%	77%	$ 477	23%	15%	12%
0	23%	100%	$ 372	20%	23%	16%

[0055] WPI Computation

[0056] In accordance with the present invention, a debtor's willingness to pay is assessed based past actions by the debtor that are indicative of level of effort to meet the current or similar obligations. Importantly, this assessment is made independently from assessing the debtor's monetary financial strength

[0057] Similarly to the API, the WPI may be constructed according to the method of FIG. **3** by forming a committee model that linearly combines a number of potential binary variables with equal weights, and then evaluating each potential binary variable using historical data to determine the discriminatory power of each potential binary variable with respect to one or more target variables (including, for example as in the case of API, charge-off and liquidation rate, and in addition, willingness to pay).

[0058] Because willingness to pay is not directly measurable as a target variable, a suitable proxy is required, preferably based on data that can be extracted from available creditor account data. For the present example, the proxy "Real Person Contact successful rate" (RPC) is used, and calculated based on available creditor data as the ratio of the number of successful debtor contacts made by the creditor to the number of total debtor telephone contacts attempted by the creditor

[0059] Table V lists the binary variables evaluated in the present example to prepare the WPI:

TABLE V

Variable	Description
W1_Autm_Pay	Whether set up auto-pay within 6 months prior to DPD
W3_Pymt_Each_Mth	Made >=1 payment in each of the 6 months prior to DPD

TABLE V-continued

Variable	Description
W4_0purchase_200pymt	Whether within 6 months prior to DPD, there was no purchase, and monthly payment >= $200
W6_Inc_Utlz_3Pymt	Within 6 months prior to DPD, utilization increased and payments were made in more than 3 months
W8_Paid_In_Full_Pre_6m	Within 6 months prior to DPD, has paid in full at least once
W9_Long_Current_Pre_6m	Within 6 months prior to DPD, has never been in delinquent status
W10_Inbound_Calls	Proactive inbound calls from the debtor

[0060] In the present example, after evaluation according to the method **200** of FIG. **2**, WPI includes the following binary (1/0) variables and cut-values:

$$WPI = w1\_autm\_pay + w3\_Pymt\_Each\_mth + w4\_0purchase\_200pymt + w6\_Inc\_Utlz\_3Pymt + w8\_Paid\_In\_Full\_Pre\_6m + w9\_Long\_Current\_Pre\_6m \quad [2]$$

[0061] It should be noted that, in the case of WPI, the associated cut-off values are effectively "embedded" in the definitions of the binary variables. For example, in the case of the variable W1_Autm_Pay ("Whether set up auto-pay within 6 months prior to DPD"), the cut-off analysis was performed in view of several possible time discriminators (e.g., whether auto-pay was set up 12, 9, 6, 4 or 2 months prior to DPD), and the value producing the highest discriminating power (6 months) was selected.

[0062] Table VI illustrates several characteristics of the WPI calculated according to the above model based on historical data. Delinquent accounts classified having a "low" WPI (e.g., values of 0 and 1), which comprise approximately 48% of the population (% Accum.Pop), have an average charge-off rate ("CO rate) that is 81% higher than the average rate for accounts with "high" WPI (e.g., values of 2-6). Accounts having a high WPI have on average a 20% higher Real Person Contact successful ("RPC") rate than accounts having a low WPI. As illustrated by way of example for API in FIG. **6**, accounts having high WPI exhibit higher average payment ("Avg Payment") rates, higher liquidation rates, and lower average rates for the percentage of payments that were at least 90 days delinquent ("Hit 90DPD Rate").

TABLE VI

	Willingness to Pay Index	% Pop	% Accum. Pop	Avg Payment	Liquidation Rate	Hit 90DPD Rate	CO Rate	RPC Rate
High	6	0.0%	0%	$1,037	29.3%	4.3%	1.7%	35%
	5	0.3%	0%	$ 859	28.4%	3.2%	2.7%	16%
	4	2.9%	3%	$ 688	28.4%	5.3%	4.4%	12%
	3	14.6%	18%	$ 667	33.4%	7.5%	5.7%	11%
	2	34.7%	52%	$ 588	29.2%	12.3%	9.1%	9%
Low	1	31.3%	84%	$ 582	21.5%	17.6%	13.1%	8%
	0	16.3%	100%	$ 568	14.5%	22.8%	16.4%	8%

[0063] Payment Behavior Model

[0064] FIG. **3** depicts a payment behavior matrix **300** that illustrates core concepts for using the API and WPI in developing an exemplary payment behavior model. As shown in FIG. **8**, the API and WPI can be classified into discrete groups, for example, into groups representative of low ability to pay and high ability to pay, and low willingness to pay and high willingness to pay, respectively. In the payment behavior matrix **300**, distinct collection treatments are indicated for paired API/WPI groups. For example, for a paired API/WPI indicating a high ability to pay and high willingness to pay (cell **310**), the payment behavior matrix **300** suggests a "friendly" reminder to the debtor without penalties or other sanctions. For a paired API/WPI indicating a high ability to pay and low willingness to pay (cell **320**), the payment behavior matrix **300** suggests a collection action that increases the debtor's incentives to pay in combination with an accelerated legal process. For a paired API/WPI indicating a high willingness to pay and low ability to pay (cell **330**), the payment behavior matrix **300** suggests a work out program or payment plan. For a paired API/WPI indicating both a low ability to pay and a low willingness to pay (cell **340**), the payment behavior matrix **300** suggests a disposal of the collection action (for example, by sale or other transfer of the account to an outside agency.)

[0065] Consistent with the payment behavior matrix **300** of FIG. **3**, FIG. **4** illustrates an example of a more detailed set of collection plans focused on mail treatments. In this case, plan actions are defined based both on debtor API/WPI groupings A-D, and on the basis of other qualifying conditions or events (in this case, accumulated number of days past due (DPD) from the deadline for the debtor's payment). In this case, the provision of successive mail treatments according to accumulated DPD reflects creditor experience suggesting that multiple contacts are often necessary for reaching a successful disposition.

[0066] FIG. **5** shows yet another example of collection plans focused on telephone call treatments.

[0067] Implementation of Method for Developing the Accounts Collection Program

[0068] The disclosed method for developing the accounts collection program is particularly suitable for implementation using a computer or computer system as described in more detail below.

[0069] FIG. **6** shows an illustrative computer system **600** suitable for implementing the present invention. The computer system **600** as described herein may comprise, for example, a personal computer running the WINDOWS XP

operation system, or a server computer running LINUX or another UNIX-based operating system. The above-described methods of the present invention may be implemented on the computer system **600** as stored program control instructions directed to control application software, for example, including statistical analysis software such as SAS.

[0070] Computer system **600** includes processor **610**, memory **620**, storage device **630** and input/output devices **640**. One of the input/output devices **640** may include a display **645**. Some or all of the components **610**, **620**, **630** and **640** may be interconnected by a system bus **650**. Processor **610** may be single or multi-threaded and may have one or more cores. Processor **610** executes instructions which in the disclosed embodiments of the present invention are the steps described in one or more of FIGS. **1** and **2**. These instructions are stored in memory **620** or in storage device **630**. Information may be received and output using one or input/output devices **640**.

[0071] Memory **620** may store information and may be a computer-readable medium, such as volatile or non-volatile memory. Storage device **630** may provide storage for system **600** including for the example, the previously described database, and may be a computer-readable medium. In various aspects, storage device **630** may be a flash memory device, a floppy disk drive, a hard disk device, and optical disk device, or a tape device.

[0072] Input devices **640** may provide input/output operations for system **600**. Input/output devices **640** may include a keyboard, pointing device, and microphone. Input/output devices **640** may further include a display unit for displaying graphical user interfaces, a speaker and a printer. As shown the computer system **600** may be implemented in a desktop computer, or in a laptop computer, or in a server. The recommendations provided pursuant to the present invention can be provided on a computer display proximate to the computer system **600** or remote from such system and communicated wirelessly to a sales person's mobile communication device. In this manner, the recommendation can be personally presented to the target customer when such customer is visited by the seller's sales person. Alternatively, the recommendations for each target customer can be provided in mass to the seller for redistribution to the appropriate sales person that interacts with that target customer.

[0073] FIG. **7** illustrates an exemplary user interface screen **1100** for display on the display screen **645** that presents API, WPI and collections plan information in a convenient format for use by a creditor or by another collector.

[0074] As illustrated in FIG. **7**, a screen **700** includes a header region **701** that for example includes information identifying the customer by name, by address and by the creditor's account number. Information about the debtor's assets and financial transactions is summarized on a leftmost panel of the screen **700**. For example, the leftmost panel includes a photo **702** of the debtor's residence, below which real estate information panel **703** presents summary information relating to the debtor's real estate holdings. Further by way of example, a recent credit card transaction panel **704** is provided at a bottommost position of the leftmost panel of screen **700**.

[0075] In a middle panel of the screen **700**, for example, a payment history panel **705** is provided to indicate a history of the debtor's payment performance against the debt. Below the payment history panel **705**, a summary of credit bureau data is provided in credit bureau data panel **706**, including two graphical symbols (upward-pointing green triangles and downward-pointing red triangles) that illustrate positive and negative trends, respectively.

[0076] Below the credit bureau data panel **706**, collector's notes are provided recording previous contacts with the debtor and associated results. At the top of the middle panel, API and WPI "gauges" **709***a*, **709***b* are provided to indicate the API and WPI, as computed for example according to the above-described API and WPI models, based on associated data for the debtor.

[0077] A rightmost panel of the screen **700** presents a further analysis of the information summarized in the leftmost and middle panels. At the top of the rightmost panel, for example, a financial health panel **707** is provided to summarize the debtor's financial health. As described above with reference to FIGS. **3-5**, a payment plan is selected as a function of the values presented by the API and WPI "gauges" **709***a*, **709***b*, and presented to the creditor for example in a call strategy panel **710** and a talking points panel **711**. It should be noted that, in the interests of security and privacy access to the screen **700** is strictly controlled (for example, by requiring a user login with password, digital certificate and/or other conventional secure access means). In addition, access may preferably be provided at several levels. For example, at a lower level of access, a more limited version of the screen **700** may be provided that omits sensitive components of the debtor's financial information (for example, the descriptions in panel **704** of the debtor's recent credit card purchases).

[0078] It should of course, be understood that while the present invention has been described with respect to disclosed embodiments, numerous variations are possible without departing from the spirit and scope of the present invention as defined in the claims. Moreover, it is intended that the scope of the present invention include all foreseeable equivalents to the elements and structures as described herein and with reference to FIGS. **2-10**. Accordingly, the invention is to be limited only by the scope of the claims and their equivalents,

We claim:

1. A computer-implemented method for selecting a financial services collection program for a debtor account, the method comprising the steps of:

determining that the debtor account meets a qualifying condition;

computing an ability to pay index (API) as a function of a debt amount for the account and one or more predetermined ability to pay indicators for the debtor

computing a willingness to pay index (WPI) as a function of one or more predetermined willingness to pay indicators for the debtor; and

selecting one of a plurality of predetermined collection program offers for the customer as a function of the API and the WPI.

2. The method of claim **1**, wherein the qualifying condition comprises a past-due condition for a payment on the account that persists for a predetermined number of days.

3. The method of claim **1**, wherein the one or more predetermined ability to pay indicators are evaluated using information selected from the group consisting of income, household assets, financial accounts, and cash on hand.

4. The method of claim **1**, wherein the one or more predetermined ability to pay indicators are evaluated using information selected from the group consisting of capacity to pay and disposable income score.

5. The method of claim **4**, wherein the selected information is provided by a creditor for the account.

6. The method of claim **1**, wherein the one or more ability to pay indicators are evaluated using information selected from the group consisting of credit limits on bankcards, credit balances on bankcards, loan balances and debtor discretionary spending.

7. The method of claim **6**, wherein the selected information is provided by one or more credit bureaus.

8. The method of claim **1**, wherein the one or more predetermined willingness to pay indicators are evaluated using information about one or more of a past action taken by the debtor or a past account status.

9. The method of claim **1**, wherein the API is computed using a respective model implemented as a committee model, the committee model combining a plurality of binary variables each based on a respective one of the one or more predetermined ability to pay indicators and evaluated as a function of a respective predetermined cut-off value.

10. The method of claim **1**, wherein the WPI is computed using a respective model implemented as a committee model, the committee model combining a plurality of binary variables each based on a respective one of the one or more predetermined willingness to pay indicators and evaluated as a function of a respective predetermined cut-off value.

11. A computer program product, comprising a computer-usable medium having computer-readable instructions embodied therein, the computer-readable program code adapted to be executed to implement a method for selecting a financial services collection program for a debtor account, the method comprising the steps of:

determining that the debtor account meets a qualifying condition;

computing an ability to pay index (API) as a function of a debt amount for the account and one or more predetermined ability to pay indicators for the debtor

computing a willingness to pay index (WPI) as a function of one or more predetermined willingness to pay indicators for the debtor; and

selecting one of a plurality of predetermined collection program offers for the customer as a function of the API and the WPI.

12. The computer program product of claim **11**, wherein the qualifying condition comprises a past-due condition for a payment on the account that persists for a predetermined number of days.

13. The computer program product of claim **11**, wherein the one or more predetermined ability to pay indicators are evaluated using information selected from the group consisting of income, household assets, financial accounts, and cash on hand.

14. The computer program product of claim **11**, wherein the one or more predetermined ability to pay indicators are evaluated using information selected from the group consisting of capacity to pay and disposable income score.

15. The computer program product of claim **14**, wherein the selected information is provided by a creditor for the account.

16. The computer program product of claim **11**, wherein the one or more ability to pay indicators are evaluated using information selected from the group consisting of credit limits on bankcards, credit balances on bankcards, loan balances and debtor discretionary spending.

17. The computer program product of claim **16**, wherein the selected information is provided by one or more credit bureaus.

18. The computer program product of claim **11**, wherein the one or more predetermined willingness to pay indicators are evaluated using information about one or more of a past action taken by the debtor or a past account status.

19. The computer program product of claim **11**, wherein the API is computed using a respective model implemented as a committee model, the committee model combining a plurality of binary variables each based on a respective one of the one or more predetermined ability to pay indicators and evaluated as a function of a respective predetermined cut-off value.

20. The computer program product of claim **11**, wherein the WPI is computed using a respective model implemented as a committee model, the committee model combining a plurality of binary variables each based on a respective one of the one or more predetermined ability to pay indicators and evaluated as a function of a respective predetermined cut-off value.

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