ANALYTICS DOCUMENTATION

* (This is not an official document; this document is prepared by the members of Analytics Team at ADF for reference purpose only)



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CREDITS TO ALL MEMBERS OF THE ANALYTICS TEAM, ADF

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1. INTRODUCTION

Personify Financial/Applied Data Finance/ ADF Data Science was founded in 2015 with the intent of helping customers with bad credit report by providing them personal unsecured installment loans by considering the person's detailed financial situation and not just with his/her credit score. To date, Personify Financial have issued more than 1,50,000 loans and still counting. Customers can now get their FICO score for free, by visiting the website.

We serve the non – prime, underbanked customers in USA. It's too risky lending money to these customers but ADF uses proper methodology and data science techniques to find their creditworthiness before offering the loans.

The company lends in several states, all of which have different state laws surrounding personal loans. To accommodate these differences, Personify Financial will either issue loans directly, or the loan will be funded through its partner, First Electronic Bank (FEB).

"This company <u>ADF Data Science Pvt. Ltd.</u> Will provide the necessary technical and analytical Support needed for Personify Financial."

Consistent with its Fair Lending and Equal Credit Opportunity Policy, ADF makes its credit products

available to all qualified applicants without regard to the following prohibited factors:

- Race, Color, Religion
- National origin
- Sex
- Marital status
- Age (provided that the applicant has the capacity to enter a binding contract)
- Receipt of public assistance or
- Fact that the applicant has in good faith exercised any right under the Consumer Credit Protection Act or any similar state law designated by the Federal Reserve Board.

THINGS THAT ATTRACT CUSTOMERS THE MOST

Origination fee: 0.00% - 5.00%, depending on your state (Higher when processing with

FEB)

Prepayment fee: None Application fee: None

Other fees: It may charge a late payment or insufficient funds fee

2. STARTER PACK

This section is focused primarily on the study materials required to start your career in analytics.

In this we cover basic topics which will initially help you to get ready to start your career in analytics

2.1 PYTHON

- Python is a programming language which enables data scientists to perform various analytics with ease.
- Always use the latest version to enjoy all the features.
- Install Anaconda software, which provides multiple IDE's to practice python.
- refer this to learn more about python.

2.2 SQL

- SQL is a query language use to manage and manipulate databases
- Install MySql Workbench to practice sql
- refer this for SQL documentation

2.3 MS EXCEL

- Microsoft Excel is a spreadsheet developed by Microsoft
- Excel is one of the benchmark tools from Microsoft.
- Which stores data in an organized form.
- Knowing excel will improve your data manipulation skills.

3. TYPES OF LOANS

3.1 SECURED INSTALLMENT LOANS

These loans require a security from the customer

Securities can be any valuable document (land/house documents, gold, etc.)

3.2 UNSECURED INSTALLMENT LOANS

These loans do not require any kind of security from the customer

3.3 TYPES OF FINANCES WE PROVIDE



We give Unsecured instalment loans with a specific Repayment Frequency.

They are

- personal loans
- student loan
- auto loan
- mortgage
- credit card

In RPOS, we provide loans to customer in real time. When a customer wishes to buy a product from a retail store. He can opt out for financial options from companies like personify financial. After verifying the customers documents and real time analysis of customers credit report, he is provided with a loan to buy the product. All these operations are quick, which can be initiated by the customer even at the time of purchase.

3.4 LOAN AMOUNT

We give loans to customers from \$1000 to \$10,000.

4. LOAN FACTORS

4.1 APR

APR stands for **Annual Percentage Rate**. It is like the term Interest (in India). Interest is nothing but the extra amount that a customer pays to the company or a loan vendor. Whereas APR means Interest + extra fee. This extra fee can be processing fee, origination fee etc.,

It ranges from 36% to 179% (as per documentation date)

4.2 POOL DEFINITIONS:

POOLS	APR RANGE
POOL A	APR<=36%
POOL B	36 <apr<60< td=""></apr<60<>
POOL C	60<=APR<100
POOL D	100<=APR>=178

4.3 APR Calculation:

$$\left[\left(\frac{\frac{Fees + Interest\ Paid\ over\ Life\ of\ Loan}{Loan\ Amount}}{Number\ of\ Days\ in\ Loan\ Term} \right) \times 365 \right] \times 100 = APR$$

suppose Raghu is taking out a \$1,000 loan. And over a 180-day loan term, he'll end up paying \$75 in interest. He'll also pay a \$25 origination fee to take out the loan.

Then Apr is 20.28%

4.4 LOAN TERM

The period that we set for a customer for repayment of his loan.

Ex: If customer takes some \$1000 loan and we give him 6 months to pay it back (principal + APR), his loan term is 6 months.

The term is usually from 12 to 48 months.

4.5 REPAYMENT REQUENCY

This is the frequency at which the customer will be paying the installment. Generally, we would ask the customer his salary deposit frequency based on which, we will choose the Repayment frequencies.

Usually they are Monthly, Biweekly, Semimonthly (15 days)

4.6 FORMULAS AND CALCULATIONS

The Monthly installment amount is calculated with the below formula,

$$[P \times R \times (1+R) ^N]/[(1+R) ^N-1]$$

P -> Principal [The Loan Amount]

R -> APR [The Annual Percentage Rate]

Suppose APR is 6%, which is in annual terms. So, we calculate it for per month with the below formula.

$$\frac{6}{12*100}$$

N -> Number of terms

Suppose the customer's term is 30 years on monthly basis.

Then N [30*12 =360]

Problem:

Suppose P is [Loan amount or principal] = \$100,000

APR = 6%

Term [T] = 30 Years

Payment frequency is Monthly then N = 30*12 = 360

First step is to calculate the **Due Amount**

This due amount is the amount of money that the customer pays back according to his Repayment frequency

In this case the repayment frequency is monthly.

Due Amount [D] = $[P \times R \times (1+R) ^N]/[(1+R) ^N-1]$

$$D = \frac{\left[100,000*\frac{6}{1200}*\left(1+\frac{6}{1200}\right)^{360}\right]}{\left(1+\frac{6}{1200}\right)^{360}-1}$$

D = \$ 599.550 [Per Month]

$$P = $100,000$$
 $R = 6\%$ yearly
 $T = 30$ years = 360 mos.
 $$599.55/mo$.

So, every month \$599.55 is paid by the customer for 30 years or 360 months.

Total amount the customer pays is = 599.55 * 360 = \$215838.19

Profit = [Principal – Total Amount Paid by The Customer]

Profit = [215838.19 - 100000] = \$115838.19

Check here for detailed explanation of the above calculation.

FAQ

- 1. What happens every month to the loan amount?
- 2. How much of the principal is deducted from the due amount?
- 3. How much of interest is recovered from the due amount?
- 4. What happens if I pay more or less than the actual due amount?

All the above said FAQ's will be answered below

For 1st month

For first month, the principal is \$100,000

Monthly interest amount = P * Monthly interest rate (or monthly APR rage)

= 100,000 * 6/12*100

= \$500

So, for first month we know the customer pays \$599.55 which is his monthly due. Out of which \$500 goes for interest and \$99.55 for principal.

Now for 2^{nd} month the interest will be calculated only for the remaining amount to be paid from the principal. i.e., \$100,000 - \$99.55 = \$99,990.45 is the new principal amount or the principal amount on the 2^{nd} month.

Note that the amount the customer is supposed to pay (\$599.55 per month in this example) will not change, what would change is the part of the amount that goes to principal and the part of the amount that goes to interest every month.

For 2nd month

P = \$99,990.45

R (which is derived from APR) = 6/12*100

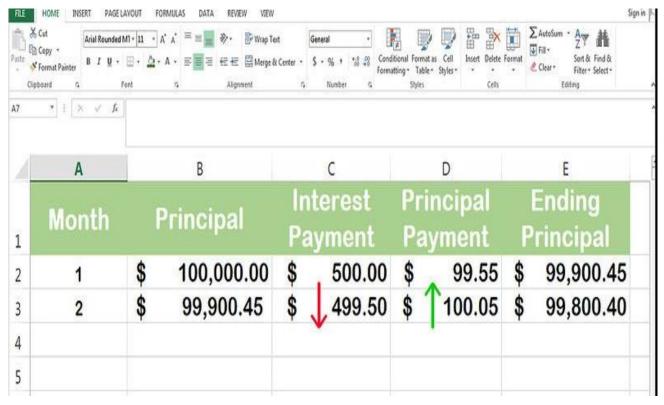
Monthly interest amount = P * Monthly interest rate (or monthly APR rate)

= 99,900.45 * 6/12*100

= \$499.50

Now out of 599.55 paid in 2^{nd} month \$499.50 is for interest and rest \$599.55 - \$499.50 = \$100.05 is from principal.

The same process continues until the end of the loan tenure [360 months].



POINTS TO NOTE

- Generally, the amount the customer must pay according to his/her Repayment frequency will not change. It is constant throughout the loan term. (in this example it is \$599.55).
- This Monthly Installment Amount is calculated by the formula
 [P x R x (1+R) ^N]/[(1+R) ^N-1]
- The thing that changes is the allocation of this amount (\$599.55) between principal and interest.
- Interests share from the amount paid are generally high at the beginning, which gradually decreases over the term.
- The principal's share from the amount will increase over the Course of time.
- This above table is called **Amortization Table**.

5. OPERATIONAL STATES

We cater the customers across different states in US in two ways

- 1. With our own license, in the name of personify financial
- 2. Through FEB (https://www.firstelectronic.com/)

In states where we don't have license to finance, we make it happen through FEB

To operate through FEB, we should follow FEB's guidelines. Initially we had permission only for <36% APR, later it grew up to 100%.

ADF STATES

ALABAMA	GEORGIA	IDAHO	ILLINOIS
MISSOURI	NEW MEXICO	SOUTH CAROLINA	UTAH

FEB STATES

ALASKA	ARIZONA	CALIFORNIA	DELAWARE
FLORIDA	HAWAII	INDIANA	KANSAS
KENTUCKY	LOUISIANA	MICHIGAN	MINNESOTA
MISSISSIPPI	MONTANA	NORTH CAROLINA	NEBRASKA
OHIO	OKLAHOMA	RHODE ISLAND	TENNESSEE
TEXAS	WASHINGTON		

One important thing to note is that each state has its own norms i.e., states may have their own constraints on the APR charged also on the loan amount.

E.g.:

In IL as per the state norms, APR above 100% is illegal. In GA as per the state norms, APR above 68% is illegal.

6. MARKET SEGMENT:

Customers in US are classified based on their FICO score.

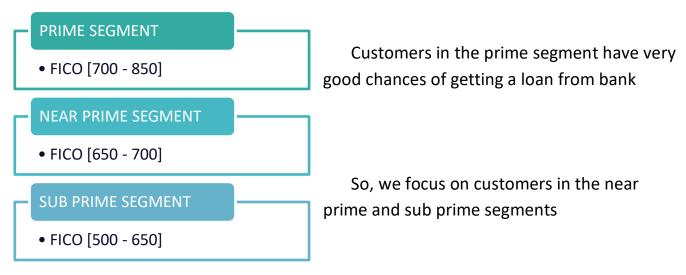
PRIME CUSTOMERS

Customers with FICO of above 700 are prime customers. They can easily grab a loan from reputed banks at a very low APR. So, we do not focus on them as they are not our target customers

SUBPRIME CUSTOMERS

We focus on those customers who finds it hard to get a loan from any of the banks in US. They find it difficult as their FICO is in subprime segment. That is between 500 and 650. The customers in this segment are our prime customer

Customers are segregated into different segments based on their FICO score as shown below



7. DELINQUENT LOANS:

A loan becomes delinquent as soon as you're late on a payment, even by a day. Here we will see all the terminologies, we use

- 1. FPD(k)
- 2. (n)PD(k)
- 3. (n)DPD(k)
- 4. XPD(k)
- 5. XDPD(k)

Here n = cycle or instance of the repayment

K = Number of Days the loan is delinquent

Loan repayment can be done in either:

- 1. **Monthly**: If the customer gets the salary every month then he can opt to repay on monthly basis.
- 2. **Semi-monthly**: If the customer gets the salary on 15th of every month then they can opt to pay on semi-monthly basis.
- 3. **Bi-Weekly**: If the customer gets his pay on every other week then his repayment will be called Bi-Weekly.
- 4. Weekly (not used, converted to biweekly): There can be some customers who gets their salary at the end of every week and he opts to repay the amount at the end of the week then he will be called Weekly costumer.
- **7.1 DELINQUENCY** It is defined as the delay in the repayment for x number of days from his repayment date then he will be called a x day delinquent customer on the x^{th} day.

Example: Loan Amount: \$ 2000, Term: 6 months, Repayment frequency: monthly, loan start date: 1-JAN-2019, 1st repayment date: 2-feb-2019, repayment amount: \$400

Now in the above given scenario if the customer fails to pay the repayment amount on 15^{th} Feb then on 15^{th} Feb, (15 Feb [current date] – 2 Feb [Actual Due date]) he will be called as 13-day delinquent customer.

Similarly, if the repayment frequency is semi-monthly i.e. 15th of every month

Then his repayment dates will be on 15th of the month and at the end of the month.

Example 1:

Loan Amount: \$1000, Term: 6 months, Frequency: Monthly, Amount: \$200,

Loan Activation date/ open date: 29th -Jan,

due	
date	Paid on
31/01	31/01
28/02	15/03
30/03	31/04
31/04	31/04
31/05	30/06
30/06	30/06

Example 2:

Loan Amount: \$1000, Term: 6 months, Frequency: Semi Monthly, Amount: \$200,

Loan Activation date: 1st -Apr,

due	
date	Paid on
15/05	31/05
31/05	31/05
15/06	31/07
30/06	31/07
15/07	31/07
31/07	31/07

7.2 FPD (FIRST past Due)

Format of FPD is FPD(K), where k represents the number of days past the due date.

In FPD we will only look at the first cycle's due date of the customer.

Delinquency Table of FPD:

FPD	Example1	example2
FPD1	0	1
FPD7	0	1
FPD15	0	1
FPD60	0	0
FPD120	0	0

From the above table, in example 1 the customer has paid the first due amount on time hence he is not delinquent even for 1 day. so, all the values are zero.

In example 2 the customer pays the amount only after 15 days from the due date. Hence, he is 15-day delinquent and for him FPD 1,7, until 15 is 1.

FPD(k) represents "FIRST DUE DATE" for k number.

7.3 DPD

Format: (n)DPD(k)

Where, n represents the cycle number which we are evaluating

k represents the number of days passed from the due date.

DPD is like FPD. **But, unlike FPD, here we can evaluate for any cycle of repayment.** Whereas, FPD is always limited to the first cycle.

Delinquency Table of DPD:

DPD	Example1	example2
3DPD1	1	1
3DPD7	1	1
3DPD15	1	1
3DPD30	1	1
3DPD60	0	0

The results were obtained by calculation the delinquency on the 3rd cycle in both the examples

In example 1: since due amount was paid only after 31 days, all the entries till 3DPD30 will be 1(True). And there is no delinquency of 60 days in this instance hence it is zero.

The results were obtained by taking the third cycle (3rd row) from example 2

In this the customer did not pay us till 45 days. All entries until 3DPD45 are all 1 (True) and 3DPD60 is 0 (False), as the customer is delinquent for 45 days in the repayment of this amount.

7.4 PD: - [MONTHLY CYCLES]

Format: (n)PD(k)

PD is the **most frequently used term**. PD's are monthly equivalent of all the payment frequency.

Question is why do we need it? To answer this question, recall the types of payment frequencies we use, which are monthly, semi-monthly, weekly, bi-weekly. These variations are practically useful but to evaluate the customers on a single scale we need a common frequency, so we go for PD [Monthly], irrespective of the cycle of repayment the customer follows PD calculates only the monthly cycles.

for semimonthly customers PD is considered for (2,4, 6.) even cycles. For example consider the following due dates of an **semimonthly customer** 1st, 2nd, 3rd, 4th, 5th n^{th.} Red once are the cycles which PD considers. Even if he is delinquent on the odd cycle but pays the amount on the red ones [Even cycles], he will not be considered delinquent as per the PD calculation.

Whereas, for biweekly we consider the alternate due dates as it forms a month (2 biweekly cycle = 1 monthly cycle). And for the customer having the repayment frequency as weekly, every 4th due date is considered as a monthly equivalent.

Let's calculate 1PD,2PD,3PD for example 1 and example 2.

PD	Example1	example2
PD1	0	0
PD7	0	0
PD15	0	0
PD30	0	0
PD60	0	0

For example1 monthly cycle is taken and below mentioned is the 1st cycle

due	
date	Paid on
31/01	31/01

As this customer has paid exactly on the due date. Hence, he has got pd1 as 0. Hence PDn>PD1 are all 0.

Similarly, in **example 2** even though the customer doesn't pay correctly in the first due date, but he repays correctly on his monthly equivalent cycle. hence, he is not considered delinquent PDn>PD0 are all 0 as shown in the below table **the dates filled in green is considered.**

due	
date	Paid on
15/05	31/05
31/05	31/05

Now let's try to find out the 2PD values for example 1 and example 2.

2PD	Example1	example2
2PD1	1	1
2PD7	1	1
2PD15	1	1
2PD30	0	1
2PD60	0	0

In **example 1** the following due date is taken for checking the delinquency of the customer.

28/02	15/03
-------	-------

As we can notice that the customer pays his dues after 15 days of the actual due date. Hence, he can be called a 15-day delinquent customer. Hence values of 2PD is 1 until day 15 (2PD15).

In example 2 we take the 4th cycle which is the due date of 2nd month

15/06	31/07
30/06	31/07

As we can see that the customer fails to pay it until 31/07. Which is 30 days more than his due date. Then he is called as 30-day delinquent for 2PD (2PD30) so 2PD1...31 =1 and 2PD32... 120=0

Similarly let's take another example and try to calculate 3PD (3rd month cycle) values for these customers.

3PD	Example1	example2
3PD1	1	0
3PD7	1	0
3PD15	1	0
3PD30	1	0
3PD60	0	0

In **example 1** the customer fails to pay for 1 month hence he will be called as 30-day delinquent customer. 3PD1...3PD30=1 and >=3PD31 is 0.

30/03	31/04

In **example 2** the following due date is considered.

15/07	31/07
31/07	31/07

Since he pays the amount without being delinquent hence all values in example2 are 0.

Consider the following frequency cycles for PD:

1st, 2nd, 3rd... due dates for monthly frequency.

2nd, 4th, 6th... due dates for semi-monthly frequency.

4th, 8th, 12th... due dates for weekly frequency.

NOTE:

- PD is always in monthly cycles
- If the frequency you are calculating is not monthly, take extreme care
- As it is easy to make mistakes
- Always convert the frequency cycles into monthly cycles

X – ANY OF THE CYCLE

7.5 XPD: When we have PD, then why do we need XPD? Now consider the situation in which we need to find the overall history of the customer. We need to check whether the customer has defaulted any of his monthly equivalent cycles in the overall history. Which helps to get better insights about the trend of his repayment.

XPD	Example1	example2
XPD1	1	1
XPD7	1	1
XPD15	1	1
XPD30	1	1
XPD60	0	0

XPD1 tells us whether the customer has been delinquent for 1 day in **his whole history OF REPAYMENT**.

In **example 1** the customer was delinquent for 30 days in 3rd cycle [Always take the cycle with maximum difference]

Hence, In example1 XPD (1...30=1)

$$XPD (31...60) = 0$$

In example 2 the customer is delinquent for 30 days in monthly equivalent 2nd cycle.

15/06	31/07
30/06	31/07

Hence XPD (1...30) = 1 and XPD (31...60) = 0.

- Used to know the overall delinquency of the customer on monthly cycles.
- even one late payment will affect the entire table.

7.6 XDPD

XDPD answers to the question whether the customer has defaulted the n days from his due date or not, irrespective of the monthly equivalent cycle.

XDPD	Example1	Example2
XDPD1	1	1
XDPD7	1	1
XDPD15	1	1
XDPD30	1	1
XDPD60	0	0
XDPD45	0	1

In **example 1** since the customer has been delinquent for at most 30 days

$$XPD(1...30) = 1 \text{ and } XPD(31...60) = 0.$$

In **example 2** if we do not consider the monthly equivalent cycles the customer has been delinquent for at most 45 days hence XPD (1...45) = 1 and XPD (46...60) = 0. This has been shown in the table entry mentioned below.

- Used to know the overall delinquency of the customer on his repayment frequency.
- even one late payment will affect the entire table.

Note:

If the customer fails to pay on the due date, we intimate them the same and allot them time to pay the due (Allotted Time)

if the customer fails to even pay on the allotted time. Then, we can apply one-time Late Fee for him.

If the customer fails to pay the amount for 120 days, then the customer is called returned off customer or charge off.

7.7 LATE FEE

This is the amount that we charge from customer for paying late. This is charged when a customer didn't pay the due amount for 15 days and this shouldn't be fined for 30 days. In other words, this late fee should be fined once in 30 days.

7.8 CHARGE OFF

After 120 days of delinquencies if customer didn't pay then we will stop generating the interest and we will collect what he owes us (Principal + interest + Late Fee)

7.9 VERSIONS

CURE: The above-mentioned methodology is called cure version

NOCURE: It is same as above but while checking for current nPDk (nth cycle). we will

also look for k days delinquency in the customers previous cycle also

(check if there is delinquency in n-1th cycle).

8. METHODS OF REPAYMENT

8.1 ACH

ACH payments are electronic payments made through the Automated Clearing House (ACH) Network. Funds move from one bank account to another with the help of an intermediary that routes funds from source to the destination. Computerized payments can provide benefits to both merchants and consumers. Payments are inexpensive, Quick, they can be automated, and recording the transactions is easier with electronic payments.

8.2 RCC

In banking, RCC stands for remotely created checks. Sometimes called bank drafts, an RCC is created, based on the bank account information provided by the consumer, and is presumed to have been authorized by the consumer. However, an RCC does not bear the actual signature of the account holder.

8.3 IF THE CUSTOMER PAYS ON TIME

There will be no change in the amortization table.

8.4 IF THE CUSTOMER PAYS EXTRA AMOUNT

So, the extra amount the customer pays than \$599.55 [monthly installment] will be cut from his principal. For example, customer pays \$610 then the remaining amount \$10.45 (610 – 599.55) will be cut from his standing principal.

Interest = \$500

Principal Payment = 99.55 + 10.45 = \$110

Now Ending Principal will be \$100,000 – 110 = \$99890

Now the interest payment for next month is calculated using this new Ending principal amount.

Customer can choose to pay larger amount than that was scheduled anytime. If this **Amount = Remaining principal + Interest**, then it is **Full Prepayment**. If it is **less than what he Owe** us it is called as **Partial Prepayment**.

8.5 IF THE CUSTOMER PAYS LATE

If the customer pays late, the customer is considered as delinquent. Initially a remainder is sent to the customer, failing which the customer can be fined for the same

If a customer has skipped 3 due payments and pays the current due, then the amount that is paid is considered as the last first due out of the 3 dues.

Also, there is no change reflecting in the amortization table

9. FICO SCORE

FICO is credit scoring system. The FICO score was first introduced in 1989 by FICO then called Fair, Isaac, and Company. The FICO model is used by the vast majority of banks and credit grantors, and is based on the consumer credit files of the three national credit bureaus: Experian, Equifax, and TransUnion

9.1 INTRODUCTION

Fair Isaac Corporation, or FICO, creates a variety of credit scores for use by lenders, credit card issuers and other creditors. Your FICO® scores — which typically

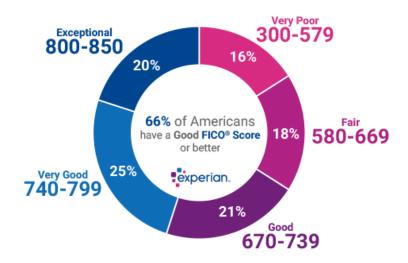
range from 300 to 850 — these scores hugely affect the customers loan approval, the repayment terms and APR he is offered.

9.2 FICO CALCULATION

FICO® Scores are calculated using many different pieces of credit data in your credit report. This data is grouped into five categories: payment history (35%), amounts owed (30%), length of credit history (15%), new credit (10%) and credit mix (10%).



9.3 FICO SCORE RANGE



9.4 BANKS ON FICO SCORE

Customers with low FICO score have high chances of defaulting the loan.

So, customers apply loan from companies like 'Personify Financial'. Here in this situation, Personify Financial gives loan to customers who come under the mentioned criteria. This is the region we operate (500 to 650). Even we don't give loans to applicants with FICO Score less than our threshold.

9.5 WORKING OF FICO

Generally, all banks share their customer details to Credit rating agencies like Trans Union, Experian and Equifax. These companies hold all the customers data.

FICO is an organization which provides score based on the customer's previous behavior.

If a customer wants to know the FICO score, he will request the bank. The bank in turn request Trans Union (TU), Experian etc., These agencies give data to the FICO and get the score. This is given to the customers (customers are charged for this service.)

9.6 THIN FILE CUSTOMERS

- These are the customers whose FICO scores does not exist.
- This is because they may be applying loan for the first time or
- They can also be customers who don't even have a credit card.

9.7 VANTAGE SCORE

A Vantage Score is a credit score jointly developed by the three major credit bureaus to predict how likely you are to repay borrowed money. It is used by lenders, landlords and financial institutions to evaluate creditworthiness.

Credit bureaus Experian, TransUnion and Equifax came up with the algorithm to produce Vantage Score in 2006, Vantage Score was on a different scale than FICO, but the most recent revisions have a 300 to 850 scale, just like FICO's.

10. CHANNELS

1. E- Mail

- A mail is sent to the leads after the prescreen process.
- Remailing is also done
- We also send offer mails to our customers

2. Social Media / Search Engine / Radio / TV

- The leads obtained through social media and search engine ad campaign.
- We only get very few leads in this method.
- Radio and TV campaigns are not in use due to its attraction of potential bad leads (leads that don't take any loan offer).

3. Organic

The types of leads that land on personifyfinancial.com directly or through search.

4. Refinance

Good standing Active loans can get more loan at lower APR in this process.

5. Reactivation

If a customer has already taken loan from us in some other past campaign And he had successfully repaid it on time

Then we give him loan based on his past behavior.

6. Affiliated

Leads obtained from other lenders and lead aggregators.

Affiliated

In Affiliated there are two main types.

10.1 LEAD AGGREGATORS



These are companies which don't give loans but redirects customers to companies like us.

Ex: Lending Tree, Credit Karma, Ping bid.

10.1.1 LENDING TREE

Customers who are looking for loans, usually visit this site, they collect basic information about the customer, and they provide the customers details to companies like us, we soft pull the customer details from TU and apply our model to it and provide them the amount, APR and term. Like personify there are other companies who do the same. The customer is provided with various offers from various lenders. [Lending Tree is like bank bazaar]

10.1.2 CREDIT KARMA (CK)

It has all functionalities like Lending tree, but here user can create login and provide more details. Companies like us filter these customers by a condition file to CK, So the data of customers who satisfy the condition is given to us. A level of filtering happens right here, this is called Pre-Qualify (CKPQ). If the customer accepts the offer within some widow period (10 days) then we provide loan to the customer with same APR that was offered to him otherwise it may vary.

(Along with this CK also provides other features to customers like giving them tips on improving their FICO score).

- **10.1.2.1 PQ(PRE-QUALIFIED)** These are the type of customer whom CK maintains the history of and according to our Requirement Criteria they will send them to us. These Leads are known as prequalified leads.
- **10.1.2.2 ITA** these are the customer whose history and score CK don't have.

If the customer takes loan from us. CK charges us an amount of \$400 for every customer.

10.1.3 PING BID

The customer visits ping bid website with all his data; this company will facilitate an open bid on the customer in which companies like us can participate with their bids. In this the risk and cost of success is high.

We mostly depend on Credit Karma.

10.2 OTHER LENDERS



Suppose if a customer has applied loan from a company like us and if the customer didn't qualify their requirements then that company will pass such customer information to other companies. This is a less used method; we also do the same (passing the non-qualified customers to other lenders) but very rarely.

10.3 COMMISSION CHARGED BY THE CHANNELS

This is based on the loan (if we give a customer loan based on that amount, we pay them, approximately \$400 per loan).

11. CREDIT RATING AGENCY (CRA)

A rating agency is a company that assesses the financial strength of companies and people.

In the United States, there are three major credit bureaus:

Equifax, Experian, and TransUnion. We mostly Use TransUnion data.

EQUIFAX

Equifax is one of the three major credit-reporting agencies. It provides information about consumer credit activity and credit scores. It also provides consumer demographics, credit information about businesses, supplier information, and platforms for the management of collections and other business activities.

EXPERIAN

Experian is best known as one of the three major credit-reporting agencies. It provides consumer and business credit data and credit scoring. Experian also offers many types of consumer data, including

- Brand preference and psychographic measures for many population segments, including kids and teens; lesbians, gays, bigender, and transgenders; and Hispanic groups
- Media behavior, brand preference, and attitudes by location down to the zip code level
- Consumer online, mobile, and other media behavior

TRANSUNION

TransUnion is one of the three primary credit-reporting agencies. It provides credit information about both consumers and businesses. TransUnion's offerings also include criminal records, bankruptcies, demographics, and other data useful for risk management and fraud prevention in several industries, including insurance, financial services, and healthcare.

11.1 DATA PROVIDERS

We know the major data providers are Experian, Equifax and TransUnion. We mostly use TU's data,

11.2 TRANSUNION

Transunion maintain credit score, credit reports and credit alert. credit report is a record of your credit activity and credit history, it includes all our loan information like company name, loan amount and payment history. If you have delinquent accounts, bankruptcies, these can also be found in your credit report.

There are two separate inquiries made

- 1. Soft Pull
- 2. Hard Pull: Contains Tradeline information as well

11.1.1 PULLING

Pulling is nothing but requesting data from TU. There are two ways.

11.1.1.1 HARD PULL (CONTAINS TRADELINE INFORMATION)

- Hard Pull is used when a credit card issuer or a lender or a financial institution checks the customer's credit report before lending money.
- Hard pulls create a negative impact on the customer's credit scores.
 Which can be reverted over time. Usually it takes 2 years.
- So, the customer should avoid too many hard pulls at the same time, which will cause huge damage to his credit report. This happens when the customer applies multiple loans from same account
- This enquiry is marked in the customer's credit report which is visible.

TRADELINE INFORMATION

- A trade line is a record of activity for any type of credit extended to a borrower and reported to a credit reporting agency.
- A trade line is established on a borrower's credit report when a borrower is approved for credit.
- The trade line records all the activity associated with an account.
- Trade lines include information on the creditor, the lender and the type of credit given.
- A closed credit account will generally remain on a trade line for seven years.

11.1.1.2 SOFT PULL

- when a credit card issuer or a lender or a financial institution checks the customer's credit report for providing them with offers or for their marketing strategies, that pull is called as soft pull.
- Both the pulls record will be maintained by TU i.e., how many times the customer's data had been pulled.

Ex:

Customer 1:

Personify - 5 times hard pull, 9 times soft pull

- But only hard pull effect the score.
- Customer may not know of being pulled.
- As hard pull reduces the customers score. we can also advertise that we are using soft pull for offering APR rates. To increase our customer's flow

We do only soft pulls, when we provide the customer with loan offer.

A hard pull is done only before sanctioning a loan.

12. FRAUD DETECTION

12.1 ID ANALYTICS

ID Analytics focuses on identity fraud risk, providing an identity score to help businesses assess the risk of identity fraud in business transactions. These scores are calculated based on a combination of personally identifiable information (such as date of birth, phone number, and social security number) and device history (computer, smartphone, and so on) to assess the risk of identity fraud.

12.2 INTELIUS

Intelius focuses on information about people and identity, including

- Verification, such as reverse phone verification and email lookup
- Information, such as people search and social net search
- Protection, such as cell phone caller ID and criminal check
- Marriage, divorce, and death records
- Business services, such as employment and tenant screening

12.3 IDOLOGY

IDology, Inc. provides real-time solutions that verify an individual's identity and age for anyone conducting business in a customer-not-present environment.

12.4 FACTOR TRUST

Collects loan performance information on nonprime consumers to provide predictive credit data, analytics and risk scoring solutions to short term lenders, installment lenders, nonprime auto lenders (and leasing companies) and other subprime credit providers.

12.5 MICROBILT / PRBC

Provides consumer credit information, bill payment information, employment information, bank account data, property records, court judgments, address and phone information on low income and subprime consumers to businesses that offer short term, rent-to-own, auto, retail and consumer finance lending.

Basically, this data uses in risk analysis and fraud detection.

12.6 CLARITY

Collects and provides information on payday loans, installment loans, auto loans (and leasing), check cashing services, rent-to- own transactions, telecommunication account openings, and financial services with an emphasis on the lower income and subprime consumer market segments. Clarity Services is owned by Experian.

Clarity data includes:

- 1.Clarity Clear Fraud
- 2.Clear Bank Behavior
- 3.Clear Credit Attributes
- 4.Clear Credit Inquiry

CCA has attributes like his loan repayment history, if customer had paid loan correctly or not etc., CCF has attributes related to Fraud like, his Computer related info (IP address). CCB has all bank records his transaction etc.,

12.2 METHODS IN FRAUD DETECTION

- If the user details, we have received doesn't match with details from other sources.
- Multiple loan applications from single IP (if a fraudster uses single computer for applying loan) – Based on IP Address.
- Single bank account multiple loans.
- Fraud applications are identified using ML models.

If a customer is identified as fraudster then we will verify the customer by calling or mailing.

There is no need of reporting clarity that a customer is a fraudster or no need to explain clarity on why we declined the loan

But we will inform clarity with details of customer, we have provided loan.

Total records Clarity given = Total records who were granted a loan + Dropped at the middle + Whom we have declined.

Dropped at middle - customer didn't take loan.

13. COMPETITORS

13.1 INSTALLMENT LOANS FOR BAD CREDIT

NAME	APR RANGE	LOAN AMT	REPAYMENT
OppLoans	59 - 199	500 - 5000	5 – 24
Rise	36 - 299	500 - 5000	4 – 26
LendUp	30 - 180	100 - 1000	3 – 12
Oportun	20 - 67	300 - 9000	6 – 46
OneMain Fin	16.05 - 24.99	1500 - 30000	12 – 60
Avant	9.95 – 35.99	2000 - 30000	12 – 60
NetCredit	34 - 155	1000 - 10000	6 - 60

13.2 RATINGS OF TYPES OF LOAN FOR BAD CREDIT

TYPE OF BAD CREDIT LOAN	AVERAGE APR	RISK TO BORROWER
Payday Loans	400%	High Risk
Title Loans	300%	High Risk
Cash Advances	400%	High Risk
Bad Credit Installment Loan	100%	Lower Risk

13.3 APR OFFERED BY OTHER FINANCIAL ORGANIZATIONS

TYPE OF LOAN	APR RANGE
Bank Loans	4% - 13%
SBA 7(a) Loans	6.3% - 10%
Online Term Loans	7% - 99.7%
Lines of Credit	8% - 80%
Merchant Cash Advances	20% - 250%
Invoice Factoring	13% - 60%

13.3 TYPES OF FEES CHARGED

FEE TYPE	DESCRIPTION
Application Fee	Nonrefundable
Origination Fee	Covers the labor in processing loan
Prepayment Penalty	For borrowers who pay off loans early
Late Payment Fee	For borrowers who miss predefined payments

14. PRESCREEN

14.1 INTRODUCTION

- In this method, we at ADF initiate the process.
- We look out for potential customers and send them loan offers

14.2 PRESCREEN WORKFLOW

- The data of the customers are screened from Trans Union and sent to Merkle based on the condition file we have provided.
- This condition file may contain simple information like the income, FICO, vantage scores etc.
- Note: we strongly work in sub prime segments [FICO of 500-750]
- Now we deploy our Response and Risk models on these leads (Customer data), this happens at Merkle.
- The corresponding scores are returned to us from Merkle
- From the scores we further filter the leads, we use different methods for different campaigns. This step is highly dynamic as it changes time to time.
- The selected customers details and the loan information are again sent back to Merkle.
- Merkle mails these leads about the offer.
- When the customer visits our website, he just needs to enter his promocode and his personal information to claim the loan.
- This loan is of decisive in nature, before transferring the funds a hard pull is done on the customer's credit report.
- If everything goes well, the customer receives at least 70% of the intimated amount. This is purely based on his credentials.

14.3 WHAT TRANSUNION AND MERKLE DOES

- Transunion has information of customers with their credit report, we mostly fetch data from TU.
- But TU will not provide us the data directly, instead it provides the requested data [based on condition file] to Merkle.
- Merkle, another 3rd party service provider is where we deploy our models
 [response and risk] on the requested data.
- Merkle provides us with limited personal information of the leads and the scores obtained on various models.
- Finally, Merkle also mails the customers about the offer on behalf of Personify Financial.

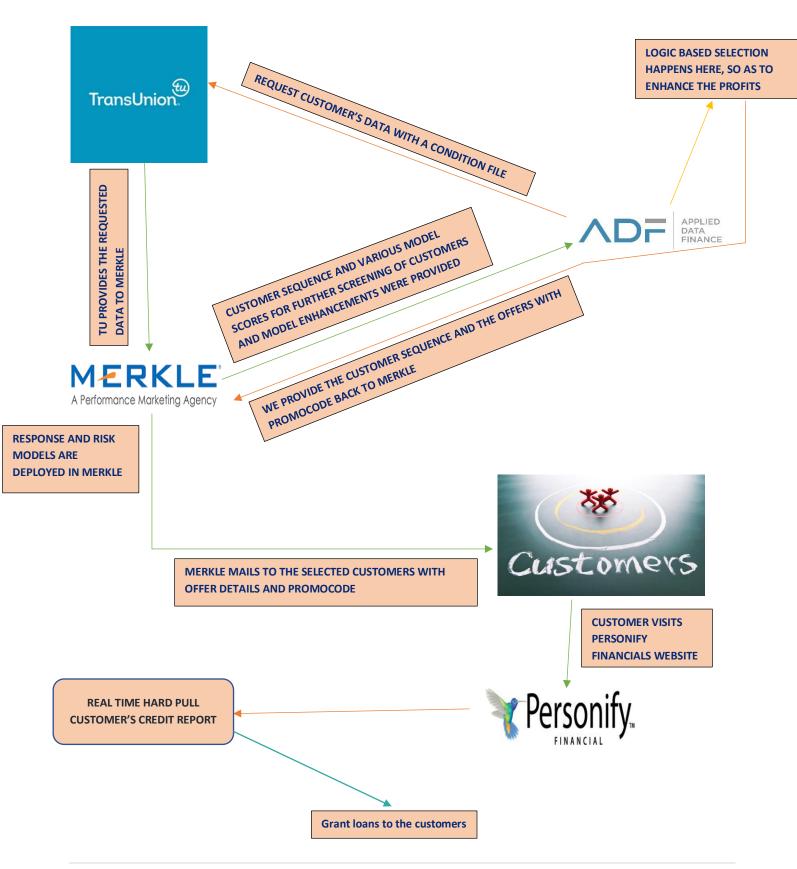
14.4 LOCAL LOGIC IN SELECTING LEADS

- The leads are divided into tiers based on the response and risk factor
- The profit and cost incurred is calculated
- Based on the previous campaign values
- Then we find the profitable leads
- Whom we report to Merkle
- Merkle in turn mails them with the loan offers

14.5 DEPLOYMENT MODELS

- The Response model is deployed to check if the customer might respond, if an offer is provided.
- The risk model is deployed to check if the customer would repay the loans without any delay.
- These scores [probability of success] are send back to us from Merkle.
- With which the local logic is framed.

14.6 PRESCREEN CHART



15. STARTER LOANS

When a lead did not qualify the real time under writing, he is disqualified from getting a loan. These customers are sometimes provided with a starter loan.

These loans are of very small amount with high ARP, which needs to be repaid in a short term

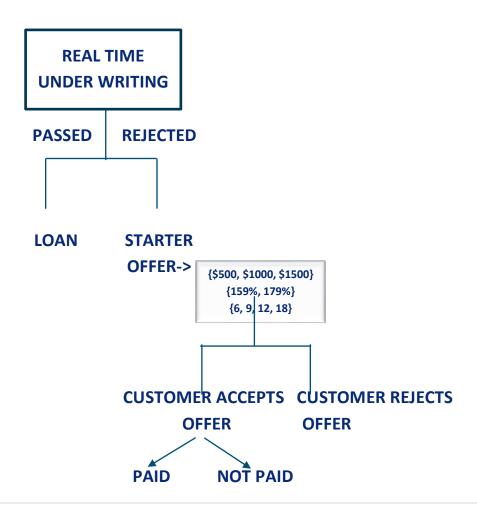
These loans are provided on a trial basis with high risk, just to check the risk of the customer. If the loan is repaid properly, this can boost his credit score. Which in turn helps him to get a loan.

E.g.: a starter loan of \$500 at an APR of 178% for a duration of 9 months

This Starter Loan was introduced from Apr 2019.

The customer might reject or accept the offer and if the lead accepts the offer then the lead may or may not pay it back.

STARTER LOANS FLOW CHART



16. POST LOAN OPERATIONS

- We hold huge responsibility after lending the loan.
- Here we take extensive measures to collect the money back.
- Even a call center is set up to cater the customers

16.1 CLOUD LENDING

- Cloud lending is a Loan Management System.
- This comes into play after a loan has been provided.
- CL maintains the loan related data of customers, whether he has paid or not, how much he paid, how much is left to pay, etc.
- Post loan services are provided by CL.

17. ADDITIONAL TERMINOLOGIES

NACHA FILE:

- This file contains the data of the customers who have their due date on that day.
- This file also has info like bank details and the amount to be cut.
- So, this file is created every day.
- This list is then checked for delinquency from the very next day onwards.

Pay Day Loans:

- Loans borrowed for short tenure
- These loans attract very high APR

18. REFERENCES

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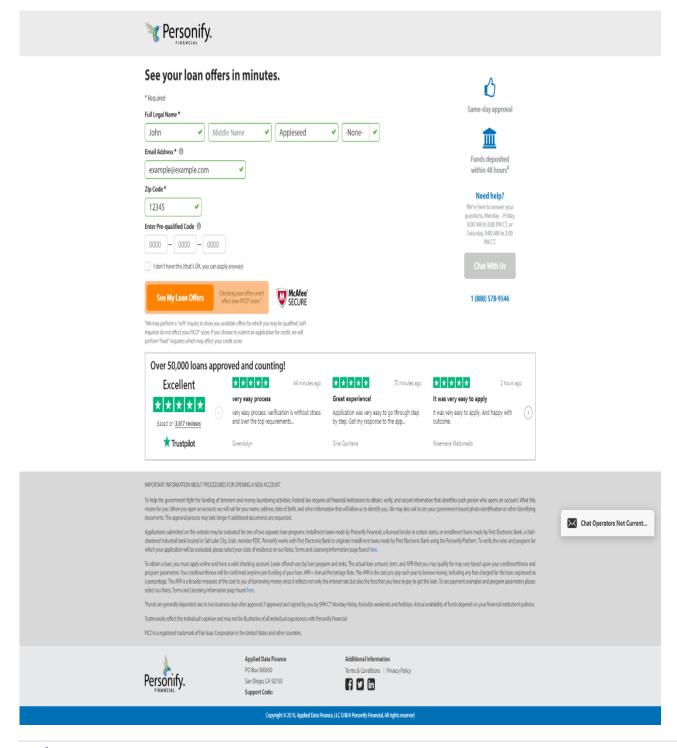
https://www.creditkarma.com/

https://pingbid.com/

PERSONIFY WEBSITE WALK THROUGH

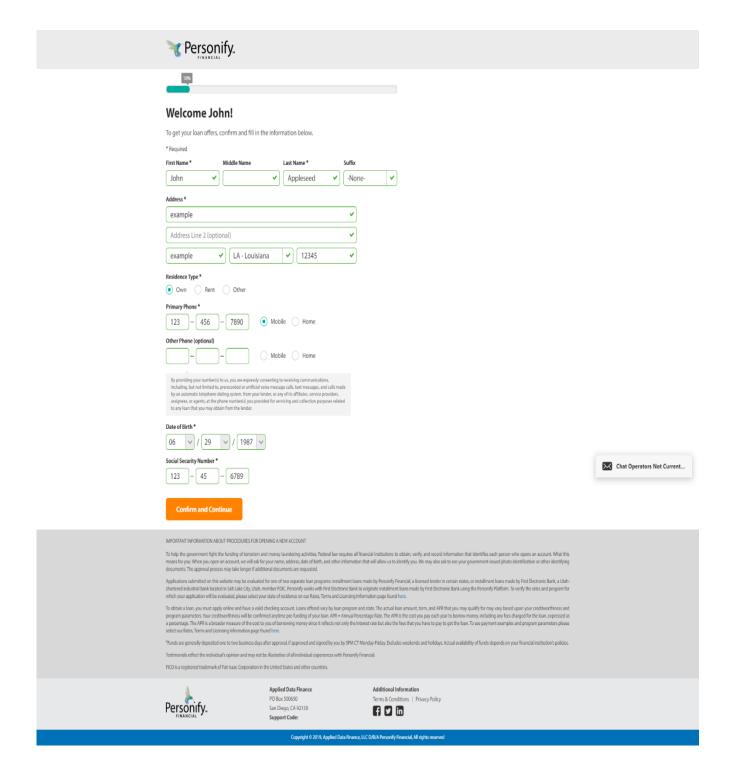
1. LANDING PAGE

- Whenever a customer visits personify financial, he will end up with this page.
- This is the initial or first screen any user would face in the loan application process. Irrespective of his channel



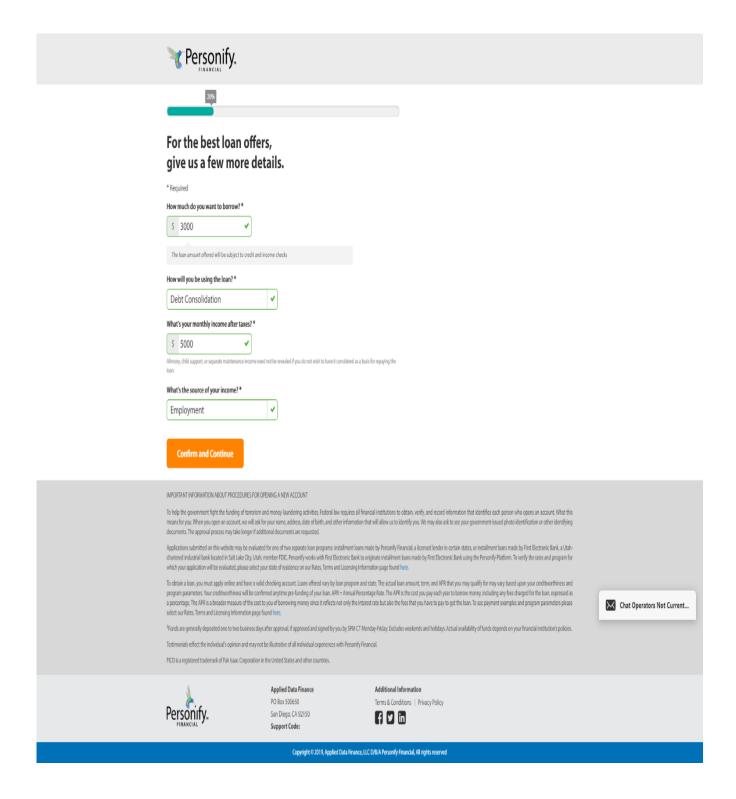
2. APPLICATION PAGE 1

- Once the customer fills up the initial details in the landing page.
- He moves to this page, where he is requested to fill his personal information.



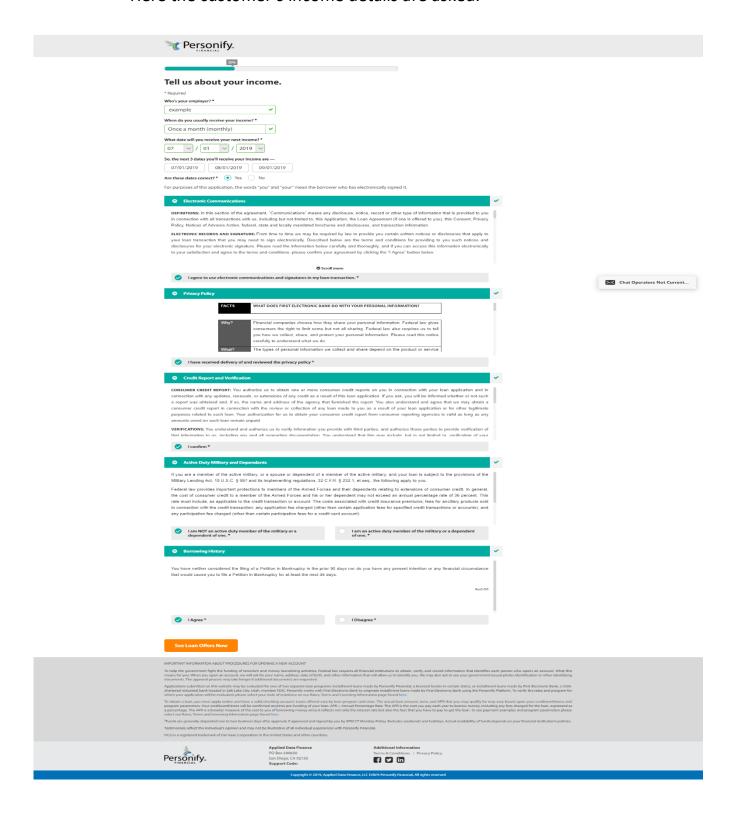
3. APPLICATION PAGE 2

- As soon as the user submits application page 1, he is brought here
- In this page his loan requirements are being asked



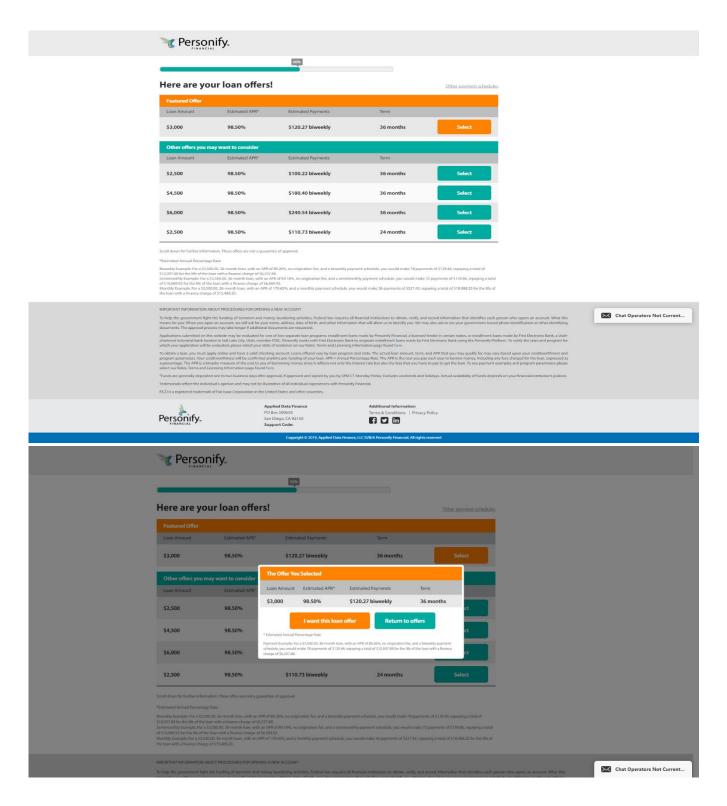
4. APPLICATION PAGE 3

- This is the page displayed once a customer submits application page 2.
- Here the customer's income details are asked.



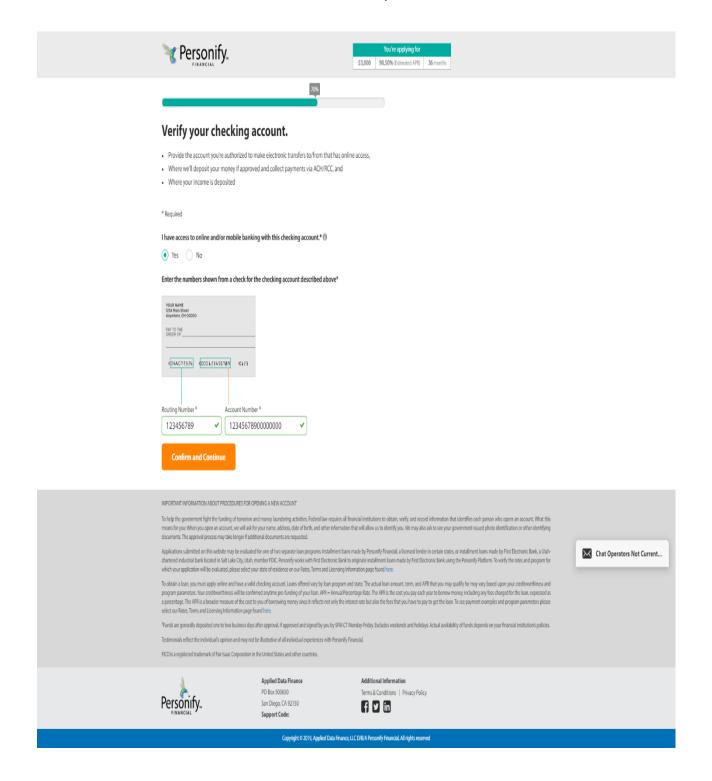
5. OFFER PAGE

- Once the customer completes all the above process.
- He is displayed with a list of eligible offers he can opt for.



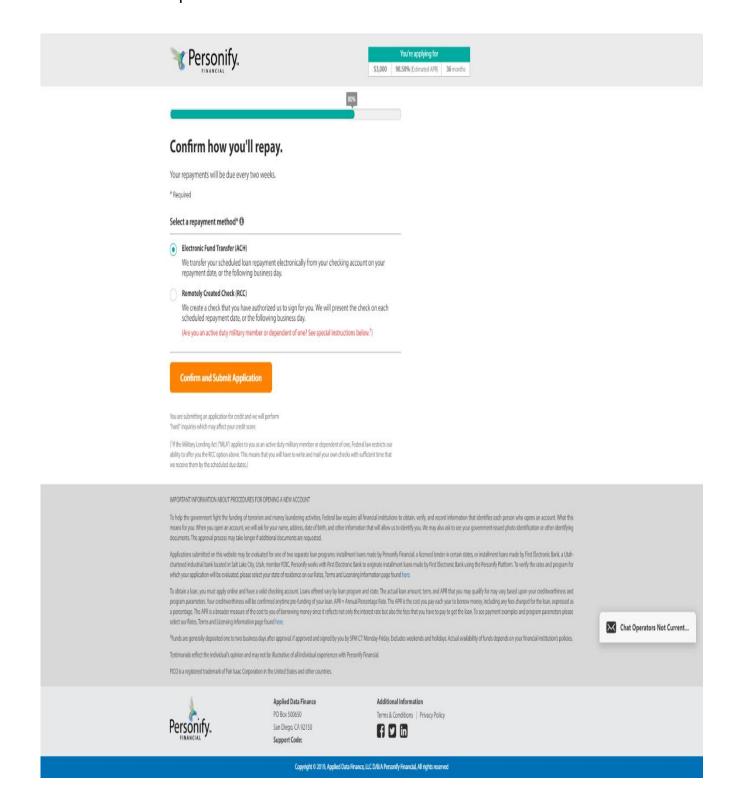
6. CHECKING ACCOUNT VERIFICATION

- Soon after the customer picks a loan from the offers.
- He is asked to fill up the details of his checking account (from which installment amount will be deducted).



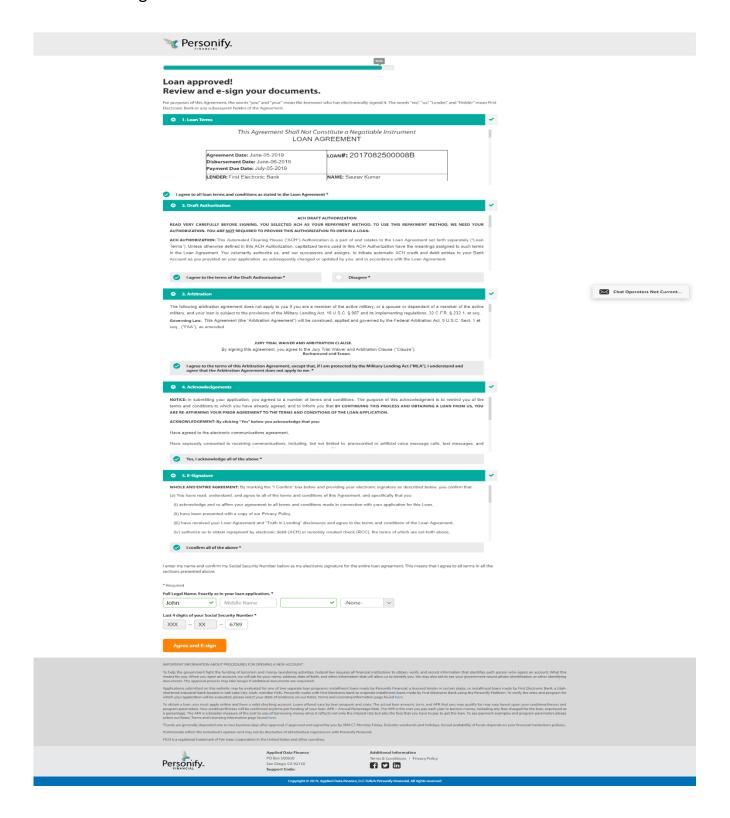
7. METHOD OF REPAYMENT

- The customer is asked to choose the repayment method
- The two prevalant methods are ACH and RCC.



8. E-SIGN OF LOAN AGREEMENT

 In this page, the customer is asked to e-sign the loan document agreement.



9. LOAN SANCTIONED

- This is the last page of the entire loan application process.
- This page will also provide the customer to give his feedback.
- Which will enhance the user experience.



Your money is on its way!

We'll transfer your money within 48 hours[‡]. How soon it appears in your account depends on your bank's policies.

Please check your email inbox for our welcome email.

View or download a copy of your loan agreement

Your first payment is due Apr 28, 2018.



IMPORTANT INFORMATION ABOUT PROCEDURES FOR OPENING A NEW ACCOUNT

To help the government fight the funding of terrorism and money laundering activities, Federal law requires all financial institutions to obtain, verify, and record information that identifies each person who opens an account. What this means for you. When you open an account, we will ask for your name, address, date of birth, and other information that will allow us to identify you. We may also ask to see your government-issued photo identification or other identifying documents. The approval process may take longer if additional documents are requested.

Applications submitted on this website may be evaluated for one of two separate loan programs: installment loans made by Personify Financial, a licensed lender in certain states, or installment loans made by First Electronic Bank, a Utal-charteed industrial bank located in Salt Lake City, Utal, member FDIC. Personify works with First Electronic Bank to originate installment bans made by First Electronic Bank using the Personify Platform. To werify the rates and program for which your application will be evaluated, please select your state of residence on our flates, Terms and Licensing Information page found here.

To obtain a loan, you must apply online and have a valid checking account. Loans offered vary by loan program and state. The actual loan amount, term, and APR that you may qualify for may vary based upon your creditworthiness and program parameters. Your creditworthiness will be confirmed anytime pre-funding of your loan. APR = Annual Percentage Rate. The APR is the cost you pay each year to borrow money, including any fees charged for the loan, expressed as a percentage. The APR is a broader measure of the cost to you of borrowing money since it reflects not only the interest rate but also the fees that you have to pay to get the loan. To see payment examples and program parameters please select our Rates. Terms and Licensing Information page found here.

Funds are generally deposited one to two business days after approval, if approved and signed by you by SFM CT Monday-Friday, Excludes weekends and holidays. Actual availability of funds deponds on your financial institution's policies.

Testimonials reflect the individual's opinion and may not be illustrative of all individual experiences with Personify Financial.

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