Qualitative Report on HELOC Automation

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Prompt 1: Dataset description and Broad Question

Banks wants to automate home equity line of credit (HELOC) decision making process so that they provide more loans to eligible customers when they need it, while helping them save cost and provide instant access to HELOC funding. To do this, the home equity dataset (HMEQ) which is available on 'Kaggle' platform will be used as a baseline for conducting qualitative research with 3 banking professionals I have reached out to for an interview. Due to sensitivity around client's data I had to choose 'Kaggle' public dataset as the data source for this project.

The HMEQ dataset contains decision outcome on 5,960 home equity loans and 12 input parameters which are used to either approve or reject loan applications. Some of the input parameters include information on 'amount of loan applied and reason for the loan', 'property value and existing mortgage amount balance' and 'sources of income and employment history' which will help the bank evaluate client's ability to repay the loan amount.

Broad Question:

In what ways can we improve the HELOC loan process to grow the business? *(I have revised my broad question as per wonderful feedback I received from* Nick Sheltrown*)*

Prompt 2: Final Report

[1115 words]

The overarching question I was trying to seek during my semi-interviews was to figure out how we could develop an automated and efficient HELOC decision model, which can approve or reject loans in shorter amount of time while helping banking advisors to focus more on needs and saving money for their customers. The HMEQ dataset was a good baseline for me to get the conversation started with my interviewee's but qualitative research findings helped me visualize the entire HELOC decision process from the time when a client applies for a loan through to when it gets finalized. This learning helped me go beyond the dataset and explore the unknowns.

Below, in this report you will read about why HELOC's are so in demand compared to other loans and how banks decide an application in conjunction with their banking guidelines. How it helps a bank avoid loan defaults and frauds but at the same time offer loans to clients who may initially not qualify for a loan but after loan re-structuring and discussions with underwriting team, are able to qualify. This process of verifying client's ability to afford a new loan using income, checking client's character based on previous repayment history, and ensuring whether HELOC (a loan secured against a house) is the right product for their clients or not, is a tedious process. It would be nice to automate

the transactional pieces of HELOC requirements but at the same time the final decision should remain in the hands of the banking advisor.

So, let's start with what is HELOC? It is a secured loan against a house where a client has at least 20% equity in the house. As stated by P1- "If it is 19.99% then it is not acceptable. It has to be 20% or above". Moreover, HELOC could be taken as a mortgage or a revolving interest payment. Mortgage is slightly cheaper (e.g. prime-0.5%) compared to revolving because just like mortgage it can be amortized over 25 years and client pays both interest and principle amount. While, revolving credit is an interest payment only and client can continue paying interest as long as they want. As indicated by P1, this difference in HELOC payment often impacts the decision outcome and affordability. Hence, I want to test the hypothesis if mortgaged HELOC is indeed preferred by clients due to lower interest rate or not? Another thing to note, is the reason why clients are applying for HELOC. As stated by P3 & P1- "Common reasons why people apply for HELOC is they might need to do renovations or buy another rental property from an existing equity. Then a very uncommon reason could be to use HELOC to max it out for stock trading or investments which can be very risky because now you are borrowing against a house". So, from the dataset I also want to see what proportion of people use HELOC for home improvement projects as opposed to stock trading/investments, and how their repayment history been.

Some other key banking guidelines and must-have includes verifying 5C's of credit (capacity, collateral, capability, character, credit history) to determine HELOC eligibility and use of income to decide affordability thresholds. As nicely put by P2 & P3- "We see gross and total debt service ratio to assess client's ability to pay loan amount based on income. So, we require GDS below 32% and TDS below 40% and credit score above 650". In an event, where client draws income from multiple sources banks have to verify each source and assess affordability based on the longest employment tenure and core domain expertise. So, I would like to see in the dataset if these features help improve loan qualifications or not. Furthermore, banks also require home appraisals, copy of property titles, fully paid government dues/taxes before they can process the loan application. Hence, it would be important to gather more data fields as discussed above and assess how target labels will probably change in the training data.

Participants informed me that they use personal assessment (PA) tool to initiate the application and see when an exception would be possible to restructure the loan application. As an example, they can consolidate debt, add co-signers and reduce the loan amount to meet the thresholds. Mentioned by P3- "Interestingly 65% of the people don't even know that they can qualify for HELOC, and so they continue buying high interest loans." I also learned that some clients go bank-to-bank shopping for HELOC loans while it takes 30 days for any credit product to show up on the credit report. This is a huge risk which lowers client's loan affordability. Hence, in this case I would like to assess missed opportunity of clients who opted for unsecured loans at a higher rate when they could have borrowed HELOC at a much lower rate.

Finally, we could not agree more that automating HELOC transactional pieces will help banks offer better AI advisory services to clients. Examples like car-loans, credit card limit increases and loan pre-assessments exists today. However, in order to build this

system, we would need to capture history of home upgrades as a part of desktop property appraisals. We would also need a system which can make credit protection services mandatory after reaching certain probability thresholds relative to change in income. From the time client walks-in, the new system should be able to not only verify must-have's / banking guidelines but also present this information in a summarized dashboard such as "top 5 loan payments by banks" and possibly "compliance report" under one open-banking platform, regardless of the bank clients use. This will shift the focus away from administrative aspect of HELOC processing and make banking more customer-driven. As nicely put by P3- "The system should be made as better advice systems just like cherry on top". Hence, from the dataset I would like to see which transactions can be grouped by and summarized to provide financial snapshot. I would also like to estimate probability of loan defaults based on income change so that system can alert when a client should buy credit protection services.

To summarize, qualitative research is in favor of HELOC automation but we have yet to estimate cost-benefits of implementing suggested changes to manual system which can currently take up to 7 processing days, potential risks associated with model decision making and complexity around gathering additional fields. By taking deeper dive in to quantitative data and testing hypothesis on customer preferences will help us set the right foot forward towards HELOC automation. As best put by P2- "Remember, banks don't give you an umbrella when you need it, banks give what they can get it back from you".