Conversation with Matt 4/2:

- Next steps: 2 rounds of interview
    - Phone interview: 1hr
        - Interviewer: one from a pool of interviewers (3 - 4)
            - Matt can share a bit more on the interviewer later
        - 5min, warm up, background, why interested in Amazon
        - Science breath: 0.5hr
            - ML
            - High level overview different science areas
            - Compare
            - Text book level
            - What's on my resume
            - Relevant to the job
            - When to use what, how they connect
        - Coding: Python coding to solve a problem
            - SDE level 1 - junior level coding bar - able to think algorithmically, standard general algorithm searching, sorting, understand basic data structure, hatches, list, arrays
            - Perfectly normal to prep for a couple of weeks
            - Live code link, not be able to run code, like notepad, whiteboard
            - Questions can be vague, Asking clarification questions, understand the problem, before jumping into solution
            - Do not dive into the code too quick
            - Think out loud of my strategy
            - They will offer hints
            - Legacy to minor sytext error
            - Python - the best option
        - Don't rush into interview, be prepared
        - Feedback within 2 business days
    - Final LOOP: will have more prepare material
        - 5 interviewers
        - Cover 4 Science competencies:
            - Assess coding,
            - Science breadth
            - Science depth: Go deep into one specific area,
            - Science application, take biz problem and think about ML solution
        - 16 PL: will share how to structure and prep
        - In between often take 2 weeks gap

- Aks Matt after the interviewer
    - Team they are on
    - How they want to structure
    - How plan to assess breadth and coding
    -
- You are not required on camera, depends on interviewers
- Do it through Chime

- Making the interview round here
- Support the interview process

- Resume matching
- Support a portion of the shopping organization
- Counterpart in recruiting - support all hiring - under VP. Lu Mason
- Matt's team support science hiring:
    - Applied, research, data science for all orgs, including Lu Mason
- Banking - pricing, selling team - dealing with numbers, **finances, causal inferences, ML knowledge, pricing and seller objectives**
- Very clear
-

Good afternoon Matt,

- My name … First of all, Thank you for considering my application for the Sr applied scientist Position at Amazon.
- With Solid background … passion … I'm excited about the prospect of bringing my skills and expertise to Amazon.
- .. Education and career … developed … strong foundation in … enable .. tackle… develop … innovative solutions
- … notable achievements:
- Building strategy
- Develop first end-to-end fully automated validation package - Fast and slow
- Took initiative and in charge of Snowflake onboarding
- Successful validation
- … Operated … regulated … importance of prudent … cautious adoption …
- … draws …. Consistent mission … pushing … pioneering … meaningful impact …
- … opportunity …dynamic… Forward -thinking … environment … creativity and innovation .. encouraged and celebrated.. Appealing..

- .. combination … a skill, tech profi…. Effective collaboration and communication … aliens well with the requirements.
- Eager … leveraging … expertise ..skill …to mission .. lifting … experience … tech advancement
- Thank you … look forward to … further … how .. skills and backgrounds .. contribute .. success of Amazon, where I ,.. Learn and grow.

- How do you match my resume to a job posting? Jieming is a friend, recommended shopping and search related posting, where I applied. Your feedback on my resume is highly appreciated and super helpful. It's a great learning process and certainly has room to improve.

- I have not applied for this job yet in the system? How often will the dashboard be updated?
- Hire manager and the team dynamic.
- Move faster through the process

My name is Hong Zhu, and I'm thrilled to have the opportunity to interview for the Sr Applied Scientist position at Amazon. With a background in predictive modeling, forecasting and causal inference in the finance sector, I am excited about the possibility of contributing to Amazon's innovative culture and solving complex problems at scale.

In my previous role at C1, I gained valuable experience in [mention relevant skills or technologies such as machine learning algorithms, deep learning frameworks, statistical analysis, etc.]. One project I'm particularly proud of is [briefly describe a relevant project or achievement]. Through this experience, I honed my ability to translate theoretical concepts into practical solutions that drive real-world impact.
I'm drawn to Amazon because of its relentless focus on customer obsession ("focus on making the beer taste better") and its commitment to pushing the boundaries of technology. The opportunity to work alongside some of the brightest minds in the industry, tackling challenging problems that have the potential to shape the future, is incredibly appealing to me.

In addition to my technical skills, I believe my ability to communicate complex ideas effectively and collaborate with cross-functional teams would be valuable assets in a dynamic environment like Amazon. I thrive in fast-paced, high-pressure situations and am constantly seeking opportunities to learn and grow.
Thank you for considering my application. I'm eager to learn more about how I can contribute to Amazon's success and am excited about the possibility of joining the team.

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- Eager … leveraging … expertise ..skill …to mission .. lifting … experience … tech advancement
- Thank you … look forward to … further … how .. skills and backgrounds .. contribute .. success of Amazon, where I ,.. Learn and grow.
-
-

My name is xx, and I am **excited** to be **interviewing** for the Sr Applied Scientist position at Amazon. With a **deep passion for innovation** and a **solid background in developing analytic solutions** for **business** decisioning, by leveraging predictive modeling, forecasting, ML, I am **thrilled** about the **prospect** of **bringing** my skills and expertise to Amazon.

Throughout my education and career, I have developed a **strong foundation** in applied statistical modeling, which has enabled me to **tackle intricate problem**s and **develop innovative solutions**. Some of my **notable achievements** include 1) developed credit modeling strategy to enable **personalized** decisioning and tailored to individual customer's credit journey for **$60b** credit card portfolio, 2) I provided analytical **insights** that prompted credit policy enhancements for better and faster decisions, measured by elevated customer satisfaction, resulting in reduced losses and program expansion. 3) I led the **successful validation** of an $80 billion commercial portfolio's loss forecasting model suite for over five consecutive years.

- Build credit modeling strategy for over $60 b portfolio to enable personalized decisions
- Led initiative to build a prototype of end-to-end fully automated validation package, partially inspired by Dr Danie Kanlmen's book and theory "think fast and slow"
- ReSolved computing resource emergency and the potential risk to delay the company's digital transformation for for more than 100+ validators by initiating and leading the effort to onboard the model validation department to cloud based computing and storage solution SnowFlake
- Led successfully validation for …

Having **operated** within a **heavily regulated** industry and no need to say by working in its governance body, I recognize the importance of **prudent** decision-making and the **cautious adoption** of cutting-edge technologies.However, such an environment can sometimes **pose limitations** for individuals.

What **draws** me to Amazon is its **commitment** to **pushing** boundaries and **pioneering** new technologies and solutions that have a **meaningful impact** on people's lives. The opportunity to work in such a **dynamic** and **forward-thinkin**g environment, where **creativity and innovation** are encouraged and **celebrated** is incredibly **appealing** to me.

I believe my **combination** of **analytical skills**, **technical proficiency**, and **ability** to collaborate effectively with cross-functional teams **aligns** well with the requirements of this role. I am eager to **leverage** my expertise to **contribute** to Amazon's **mission** of c**ontinuously lifting the bar** for customer experience and technological advancement.

Thank you for **considering** my application. I look forward to the opportunity to **further discuss** how **my** background and skills can contribute to the **success** of Amazon, where I can keep learning and growing.

My name is Hong Zhu, and I am honored to be considered for the Senior Applied Scientist position at Amazon. With a profound interest in innovation and a robust background in crafting analytical solutions for critical business decisions, I am deeply enthusiastic about the prospect of contributing my skills and experience to Amazon.

Over the course of my career, I have cultivated a strong expertise in applied statistical modeling, enabling me to address complex challenges and devise groundbreaking solutions. Among my notable accomplishments, I spearheaded the development of a credit modeling strategy tailored to individual customer credit journeys, optimizing decision-making for a $60 billion credit card portfolio. Additionally, I provided analytical insights that prompted credit policy enhancements, resulting in reduced losses and program expansion. Moreover, I led the successful validation of an $80 billion commercial portfolio's loss forecasting model suite for over five consecutive years.

Having operated within a heavily regulated industry, I recognize the importance of prudent decision-making and the cautious adoption of cutting-edge technologies. I observed firsthand the significance of maintaining a balance between innovation and compliance, evidenced by my former employer's pioneering move to adopt AWS, positioning us as industry leaders.

Amazon's relentless pursuit of pushing technological boundaries and delivering impactful solutions resonates deeply with me. The opportunity to contribute to such a dynamic and forward-thinking environment, where creativity is celebrated and innovation is nurtured, is immensely appealing.
I am confident that my blend of analytical acumen, technical prowess, and collaborative spirit aligns closely with the demands of this role. I am eager to leverage my expertise to further Amazon's mission of elevating customer experiences and driving technological progress.

Thank you for considering my application. I am genuinely excited about the possibility of discussing in more detail how my background and skills can contribute to the continued success of Amazon.

16 Leadership Principle

1) Customer obsession
2) Ownership
3) Invent and simplify
4) Are right, a lot

5) Learn and be curious

6) Hire and develop the best
7) Insist on the highest standards
8) Think big

9) Bias for Action
10) Frugality
11) Earn Trust
12) Dive Deep

13) Have backbone, disagree and commit
14) Deliver results
15) Strive to be earth's best employer
16) Success and scale bring broad responsibility

Interview Logistics

1hr - 2 to 3 stories
15 min per story
S - 2 min
T - 1 min
A - 5 min
R - 1 min
Then interviewers will ask questions, e.g what obstacles you encountered, how did you overcome, or if can't overcome, then how you handle yourself, control emotion
Ask a 2 deeper questions to the interviewers to leave impression
Resume: to general, hard to tell what you did, include structure of PPT, model difficult, result, need to go deeper

Stories

1. Snowflake onboarding

LPs Ownership,Think big, Have backbone, disagree, and commit, Deliver results, insist on the highest standards

Behaviors: challenges, problem solving, alliances, persistent, positive thinking, communication skills, leadership, lead without authority,

Short version:
Situation: The company's analytics community was transitioning from Teradata to Snowflake as part of its digital transformation, moving from data centers to cloud-based computing and storage.

Task: While most 1st line of business (LOB) teams and some 2nd and 3rd line of defense teams had successfully onboarded to Snowflake in the period of 6 to 12 months, the Model Risk Management group was lagging behind, posing risks of delays and reputational damage due to the inability to allocate Snowflake resources for validation functions.

Action: As senior manager of the validation team, I led the entire model risk group's transition to Snowflake. Learning from previous attempts, I conducted thorough investigations, including interviews with audit and credit review teams, collected cost statistics for each LOB, and collaborated with tech teams and other validation units. I presented a comprehensive proposal to our SVP, gaining approval and conducting training sessions to expedite the process.

Result: Through persistent efforts and collaboration, I successfully resolved the computing resource challenge for over 100 validators, enhancing efficiency and ensuring a smoother transition to cloud-based operations. Additionally, I mentored a junior associate, emphasizing the importance of initiative and making a positive impact beyond one's job description.

Long version:
2min

Situation: The company's analytics community was undergoing a transition from Teradata to Snowflake as part of the company wide digital transformation, shifting from data centers to cloud-based computing and storage. While all 1st line of business (LOB) analytic teams (such as Card, Commercial, Auto finance, Retail banking model development teams) and some 2nd and 3rd line of defense teams have completed onboarding to Snowflake over a period of 6 to 12 months, the Model Risk Management group part of the the 2nd line of defense team is notably falling behind. No effort to initiate the onboarding. This delay poses a risk as individual validators may encounter significant barriers in allocating Snowflake computing warehouse resources for daily validation functions. Such obstacles could disrupt major validation projects, leading to delays and reputational risks with regulators. This situation often led to exceptional requests to extend the decommission timeline of Teradata, this not only reduces efficiency (query on SF to be many many times faster compared to Teradata while all else are equal), what's more importantly is that it goes against the organizational objective of 100% transitioning to the cloud.

Tasks: Extending the Teradata decommission timeline was a short-term solution to keep validation on track. As a senior manager of the validation team, I took the initiative to lead the entire model risk group's transition to Snowflake. The goal wasn't to dwell on why this hadn't been addressed earlier while other peers teams are far ahead of us, but rather to ensure a

successful onboarding to Snowflake for our group, providing every validator with access to computing resources as needed.

Actions:
My Snowflake onboarding journey took two attempts, but the second time proved successful. What did I learn? Well, firstly, I realized the importance of finding allies within the organization, especially when facing challenges like restricted resources. This alliance helped shift priorities and gain support from our leaders. Secondly, I conducted thorough investigations to gather crucial data metrics, such as real-time usage and cost analysis, which were essential for making informed decisions. Additionally, I reached out to other teams who had already made the transition to Snowflake, learning from their experiences to better anticipate potential obstacles. Lastly, I collaborated closely with tech teams and other validation units, ensuring clear communication and objectives. When presenting the proposal to our senior leadership, I provided three options with a clear recommendation, backed by an impact analysis in terms of risk, effort, and cost. Fortunately, our proposal was approved, and we successfully completed the onboarding within two months. Following this achievement, I also conducted training sessions to help expedite Snowflake utilization across our teams for daily validation projects.

In my initial attempt, I fixated on the idea of using another team's warehouse, driven partly by frustration over why the issue hadn't been resolved earlier. However, I realized this approach wasn't feasible. I also recognized the significance of seeking support and highlighting urgency beyond what may seem obvious. It's crucial to shift mindset and view situations from our leaders' perspective, trusting their judgments and understanding their priorities. Competing priorities are always there. This shift helps prevent tunnel vision and ensures better alignment with organizational objectives.

Result: I successfully resolved a significant computing resource challenge for the entire organization, involving over 100 validators. This action aimed to enhance efficiency and prevent any delays in transitioning to 100% cloud-based operations. Additionally, I mentored a junior associate throughout the course who recently joined the team, emphasizing the importance of taking initiative and going beyond one's job description to make a positive impact.

Situation: The company was in the midst of a comprehensive digital transformation, transitioning its analytics community from Teradata to Snowflake to embrace cloud-based computing and storage. While most 1st line of business (LOB) analytic teams had successfully migrated to Snowflake over the course of 6 to 12 months, the Model Risk Management group, a part of the 2nd line of defense, was notably lagging behind. This delay posed a significant risk, potentially hindering daily validation functions due to resource allocation issues. The inability to onboard to

Snowflake promptly jeopardized major validation projects, exposing the company to delays and reputational risks with regulators. Furthermore, this delay led to requests to extend the decommission timeline of Teradata, undermining the organizational goal of complete transition to the cloud.

Tasks: Recognizing the short-term nature of extending the Teradata decommission timeline, as a senior manager of the validation team, I spearheaded the transition of the entire model risk group to Snowflake. Rather than dwelling on past setbacks, my focus was on ensuring a smooth onboarding process for our team, guaranteeing access to necessary computing resources for each validator.

Actions: My journey to onboard the team to Snowflake required persistence and strategic thinking. I learned the importance of building alliances within the organization, particularly in overcoming resource constraints. These alliances were instrumental in garnering support from leadership and shifting priorities. Additionally, I conducted thorough investigations to gather crucial data metrics, enabling informed decision-making. Leveraging insights from teams that had already transitioned to Snowflake, I anticipated potential obstacles and devised strategies to overcome them. Collaboration with tech teams and other validation units ensured clarity of objectives and effective communication. Presenting a well-researched proposal to senior leadership, I provided multiple options with a clear recommendation, supported by an impact analysis. Fortunately, our proposal was endorsed, and the onboarding process was completed within two months. Subsequently, I conducted training sessions to expedite Snowflake utilization across our teams.

Reflecting on my initial attempt, I realized the pitfalls of fixating on temporary solutions out of frustration. I understood the importance of seeking support and emphasizing urgency to align with organizational priorities. By adopting a broader perspective, I avoided tunnel vision and ensured alignment with overarching objectives.

Result: Through proactive measures, I successfully addressed a significant computing resource challenge for the organization, benefiting over 100 validators. This initiative aimed to enhance efficiency and facilitate the transition to cloud-based operations. Additionally, I mentored a junior associate, emphasizing the value of initiative and proactive problem-solving beyond job descriptions.

2. COVID (2020 Oct) Validation

Ownership, Customer obsession, Invent and simplify
Challenges, organized, well managed,

S (2m)

Soon after COVID started, we started to observe model performance breakdown. Fed requested banks to conduct an additional stress test which is due in 2020 Oct. The routine stress test is due March 15th each year. Banks received notification around the end of July to early Aug. For each stress test submission, banks have to submit full documentation and data packages. All models used by stress testing need to be validated. Especially the ones that were changed due to the performance issues. For example, probability of default is positively correlated with elevated unemployment rate and unemployment insurance claim. In April 2020, We observed an unprecedented rapid spike of both economic indexes, ER changed from 5% to 14.6% in one quarter 2020. The model prediction is under extreme extrapolation which is way outside the historical data range. In addition, unprecedented economic stimulus bills passed by congress. In reality, the defaults are even lower than before COVID. The forecast based on the models was not able to capture the true dynamic.

T

In just 2 months, I spearheaded a team of 4 associates tasked with delivering comprehensive validation reports covering the entire commercial loss forecasting model suite, encompassing approximately 12 models. Half of these models were newly introduced in this cycle due to performance concerns. Our end-to-end validation process involved parallel validation alongside development, conducting thorough analyses, and presenting effective challenges for key assumptions, limitations, and weaknesses. We then delivered the validation reports, identified key model risks, and engaged with model developers and owners to ensure understanding and approval from the Chief Model Risk Officer (CMRO)

(1m)

Over a span of 2 months, I led a team of 4 associates in the delivery of comprehensive validation reports for the complete commercial loss forecasting model suite, comprising roughly 12 models. Half of these models were introduced in this cycle due to performance concerns. Our validation process entailed parallel validation during development, meticulous analyses, and the presentation of robust challenges for key assumptions, limitations, and weaknesses. Subsequently, we delivered the validation reports, identified critical model risks, and collaborated with model developers and owners to secure understanding and approval from the Chief Model Risk Officer (CMRO).

A

The first thing I did was to discuss priorities with my boss and the team. The workload was extremely heavy, we have never validated this model with this high level risk before. The fact is that C1 is the only bank with 7 banks in our size that decided to make major model changes and fully validated them as well in that additional stress testing cycle. “Mission impossible”. I proposed a clear decisioning trade-off on what are the Must Have items from the regulators’ perspective. As the result will be an exam by the Fed and OCC and we’ll have to answer their questions. The items in the ‘good to have’ category were deprioritized. This doesn't mean we lower the bar. In the country, the objective in my mind is to hold the bar high given the nature of this additional stress test. Careful prioritization is the way to maintain the high standard and get it done, and get it done on time with high quality. I proposed to conduct validation by focusing on

documenting the changed model component and model risks around COVID specific economic scenarios and the embedded risks in the forecast. Especially including major model limitations and what actions will be needed to remediate the limitations.

Secondly, I teamed up with 2 associates as an ‘assembly line’ in order to push out results faster and consistently. This is how I assigned the work. My responsibility is to write up validation reports, the other 2 associates are assigned different analyses. I also come up with a transparent timeline with our model development team as well as my boss of where we are every step.

Thirdly, where to focus in terms of risks. I decided to be a forward looking approach. Focusing on the forecast, especially the boundary conditions, when the model could break, as if we stress the model forecast ourselves. Risk identification can be tricky. As the evidence may not always be obvious or super solid. Mistakes are rare, especially major mistakes. I think from the use of the model and the impact from the forecast to the firm’s capital planning. I also generated a validation risk identification framework to ensure, we cover all the major dimensions, and we can use it size model risk and defend our decision why something is not considered as a model risk.

Action: Firstly, I initiated discussions with my boss and the team to establish priorities given the heavy workload and the heightened risk associated with validating the model. Recognizing the significant regulatory scrutiny ahead, I proposed a clear trade-off decisioning framework to prioritize "Must Have" items from the regulators' perspective, ensuring we meet stringent examination requirements. While we didn't compromise on quality, we deprioritized items in the 'good to have' category to maintain efficiency. I advocated for a focused validation approach, emphasizing documentation of model changes, COVID-specific economic scenarios, and embedded forecast risks, along with proposed remediation actions.

secondly, I adopted a proactive risk management approach, concentrating on forecasting boundary conditions and potential model vulnerabilities. Risk identification was approached with foresight, considering model usage and forecast impact on firm-wide capital planning. To ensure comprehensive risk coverage, I developed a validation risk identification framework encompassing key dimensions, facilitating robust decision-making and defense of risk exclusions.

thirdly, organized a team of 2 associates to function as an 'assembly line' for faster and consistent results. Tasks were assigned accordingly: I focused on writing validation reports, while the associates handled various analyses. I established a transparent timeline with our model development team and my boss to track progress at every step.

Lastly, I also proposed to my boss to build a dashboard for commercial stress testing outcome analysis using AWS Quicksight. The objective is be able analyze the forecast result timely, and analyzing potential issue by dissecting data by various dimensions to gain insights, patterns, and comparing economic scenarios across stress testing cycles, and forecasting result between primary models and challenger models.

(4min)
Action: Firstly, I initiated discussions with my boss and the team to establish priorities given the heavy workload and the heightened risk associated with validating the model. Recognizing the significant regulatory scrutiny ahead, I proposed a clear trade-off decision framework to prioritize "Must Have" items from the regulators' perspective, ensuring compliance with stringent examination requirements. While maintaining quality, we deprioritized items in the 'good to have' category to enhance efficiency. I advocated for a focused validation approach, highlighting documentation of model changes, COVID-specific economic scenarios, and embedded forecast risks, along with proposed remediation actions.

Secondly, I adopted a proactive risk management approach, focusing on forecasting boundary conditions and potential model vulnerabilities. Risk identification was conducted with foresight, taking into account model usage and forecast impact on firm-wide capital planning. To ensure comprehensive risk coverage, I developed a validation risk identification framework encompassing key dimensions, facilitating robust decision-making and defense of risk exclusions.

Thirdly, I organized a team of 2 associates to function as an 'assembly line' for faster and consistent results. Tasks were assigned accordingly: I focused on writing validation reports, while the associates handled various analyses. I established a transparent timeline with our model development team and my boss to monitor progress at every step.

Lastly, to be proactive, I proposed to my boss the creation of a dashboard for commercial stress testing outcome analysis using AWS Quicksight. This dashboard aims to analyze forecast results promptly, identify potential issues by dissecting data across various dimensions, and gain insights into patterns and economic scenarios across stress testing cycles, as well as compare results between primary and challenger models. We built the dashboard in Nov, which has been approved to be an extremely valuable tool for us and our bosses. The Model development team was also interest in the way we built it.

Finally, taking a proactive approach, I suggested to my boss the development of a dashboard for analyzing commercial stress testing outcomes using AWS Quicksight. This dashboard is designed to promptly analyze forecast results, pinpoint potential issues by examining data from various dimensions, and provide insights into patterns and economic scenarios across stress testing cycles. It also allows for comparison between primary and challenger models for model

weaknesses and the reason behind. I was able to convince my boss to shift the priority to build it. We successfully built the dashboard in November, and it has since been recognized as an invaluable tool by both our team and our superiors. Additionally, the Model Development team has shown interest in our approach to building it.

Finally, adopting a proactive stance, I proposed to my boss the development of a dashboard using AWS Quicksight to analyze commercial stress testing outcomes. This tool facilitates prompt analysis of forecast results, identifies potential issues across various dimensions, and provides insights into patterns and economic scenarios during stress testing cycles. It also enables comparison between primary and challenger models, shedding light on model weaknesses and their underlying causes. Successfully convincing my boss, we prioritized its development and completed the dashboard in November. Since then, it has proven to be an invaluable asset, receiving recognition from both our team and senior management. Moreover, our approach has piqued the interest of the Model Development team.

R
We successfully delivered validation reports on schedule and maintained high quality throughout. In the following internal reviews and OCC and Fed joint exam, there were no major concerns raised by internal review panels, challenge forums, or regulatory bodies. The approach that I proposed has proved to be effective and efficient, ensuring both timeliness and thoroughness. Importantly, we avoided overburdening the team, preserving a positive team atmosphere and dynamic.

3. PIE (Pipeline of Integrated Evaluation)

Invent and simplify
Ownership
Customer obsession
Learn and be curious
Hire and develop the best
Insist on the highest standards
Think big
Bias for Action
Frugality
Deliver results
Frugality

Problem solving, lead on initiative, self-motivated, lesson learned,
Failure is necessary. It's the learning, it's the pathway to success.
Uncertainty is everywhere.
Fixed vs growth mindset

RAS system

Situation:We perform validation across a range of models, frequently encountering repetitive elements in our analysis and final reports for similar model types. Recognizing this, I view an opportunity to automate validation tasks, enabling validators to dedicate their attention to areas demanding their expertise. Drawing inspiration from Dr. Daniel Kalman's book 'Think Fast and Slow,' I intend to establish a Fast system through automation, like in auto pilot, then allowing validators to focus on the 'Think slow' aspects. This strategy is expected to improve the efficiency and quality of our validation process.

Task:We aim to develop a prototype for a fully automated validation package, covering the entire process from data ingestion to generating a preliminary validation report. I envision that the user only need to run a line of script in the terminal window, no intermediate steps are needed. This report includes vital assessments, along with charts, tables, and narratives. Validators can then refine the draft report as necessary, improving validation efficiency and maintaining consistency throughout the process.

Actions:I led a team of 5 associates on this initiative. First of all, we established the objective, the problem to be solved and the end product we want to see. Based on the time and resources we have, this is a side project, and we can't prioritize it against any other validations. Our goal is to build a prototype on OLS models as a proof of concept. OLS is a relatively simpler model yet still has a wider range of application cross modeling space, e.g. balance forecast, loss forecast, deposit forecast, etc. And we decided to use R instead of Python given the familiarity of the language and the convenient way of generating LaxTax files for validation reporting purposes, which also can be converted to word documents.

I want our team to all move towards the same north star to avoid derailment. The last thing I want is to have this project led by analytical interest. This project could have opportunities to be expanded to a company wide initiative at some point in time given its potential value. However, that is now my goal, not yet. I want to use this prototype to make a point and to demonstrate the potential in about 3 months rather than 3 years. This was my strategy to give it a chance to plant a seed and to grow.

Once our team all knew the objective and scope of this project, we started to design the key modulus and assign tasks to each team member after considering their validation work load.

Meanwhile, I discussed this idea with my manager and ensured the quality and timely delivery of our existing validation project. He is reasonably supportive of this initiative. This is the only initiative in our team.

I also worked with the developers on providing clear documentation for better user experience and conducted multiple testing to ensure the decent quality.

Result: Over the period of 4 months, we were able to develop a prototype package to generate preliminary validation reports. We shared with the validation group as well as via internal conferences for the analytical communities. Our approach drew attention from our MVP and connected us to the enterprise ML team to seek potential opportunities to be integrated into their initiatives. We also use the package wherever applicable, and carry out ongoing maintenance. We also integrated this package with another automation tool for validation purposes.

This experience is extremely unique for me and the team given the validation role in nature. However, this is a proof that one can always find opportunities to invent and improve.

Situation: Our validation process often involves repetitive tasks, such as standard tests for the same type of models, leading to inefficiencies and potential errors or inconsistency in our reports. Recognizing this through years of validation experience, I saw an opportunity to revolutionize our approach by automating these tasks, freeing up validators to focus on areas requiring their expertise. Inspired by Dr. Daniel Kalman's principles as in the book "Think Fast and Slow," I aimed to create a Fast system through automation, akin to autopilot mode, allowing validators to concentrate on the more thoughtful aspects of their work. This strategic shift was anticipated to enhance the efficiency and accuracy of our validation process.

Task: Our objective was to develop a prototype for a fully automated validation package, encompassing everything from data ingestion to the generation of preliminary validation reports. The goal was for users to execute a single line of script in the terminal, eliminating the need for intermediate steps which can be time consuming and subject for human error in return. I deliberately decided not to build a user interface, given itself can be a time consuming task and not essential for automation. These reports would include essential assessments, supplemented with charts, tables, and narratives. Validators could then refine these reports as needed, streamlining the validation process and ensuring consistency. This is not a teaching or training tool for one to learn basic statistical testing, such as, non-linearity, non-constant variance, normality of errors, correlation between explanatory variables and error terms, statistical significance, independence of errors, autocorrelation to occur with time-series data, outliers, leverage, influence, multicollinearity, etc. Some of based on visual examination, some are based on different statics and tests. I’m prone to leverage multiple tests for the same assumption, given each test has its own limitations. So why need to pick and choose every single time and based on someone’s preferences. We can conduct all the tests which won’t take much time, and can be assessed afterwards.

Actions: Leading a team of five associates, we outlined our objectives, identified the problem to be solved, and envisioned the desired end product. Recognizing the constraints of time and

resources, I treated this as a side project without compromising our primary validation responsibilities. I decided to focus on building a prototype for Ordinary Least Squares (OLS) models, given their simplicity yet wide applicability across various modeling domains. Opting for R over Python due to its familiarity and ease of generating LaxTax files for validation reporting, we began working towards a proof of concept.

To maintain alignment within the team, I emphasized a common goal and steered clear of letting individual analytical interests derail the project before we gained more traction. While the potential for this initiative to scale company-wide was acknowledged, our immediate aim was to showcase its value within three months rather than years. This strategic approach aimed to sow the seeds for future growth.
Once everyone understood the project's scope, we designed key modules and delegated tasks based on individual workloads. Simultaneously, I kept my manager informed, ensuring the quality and timely delivery of our ongoing validation projects, receiving reasonable support for this initiative as the sole focus of our team.

Collaborating with developers, I documented the process meticulously to enhance user experience and conducted rigorous testing to ensure quality.

Result: Within four months, we successfully developed a prototype package for generating preliminary validation reports. We shared our approach with the validation group and presented it at internal conferences, garnering attention from key stakeholders, including the MVP and the enterprise Machine Learning (ML) team. This led to discussions about potential integration into their initiatives. We continued to utilize the package wherever applicable, incorporating ongoing maintenance and integrating it with other automation tools for validation purposes.
This experience was transformative for both myself and the team, showcasing the potential for innovation even within traditionally structured roles like validation. It underscored the importance of seizing opportunities for improvement and invention in any domain.

Situation: Over the years, our validation process has been burdened with repetitive tasks, particularly standard tests for similar types of models, resulting in inefficiencies and the risk of errors or inconsistency in our reports. Drawing on my extensive experience in validation, I recognized an opportunity to overhaul our approach by automating these tasks, thereby liberating validators to focus on the more nuanced aspects of their work. Inspired by Dr. Daniel Kalman's insights in "Think Fast and Slow," my aim was to create an automated system, akin to autopilot mode, allowing validators to devote their attention to the more strategic elements of validation. This strategic shift was poised to elevate the efficiency and accuracy of our validation process significantly. In addition, this approach can be scalable and extended to any type of models as well.

Task: Our primary objective was to develop a prototype for a fully automated validation package that could seamlessly handle everything from data ingestion to the generation of preliminary validation reports. The ultimate goal was to empower users to execute a single line of script in the terminal, eliminating the cumbersome intermediate steps prone to human error. Forgoing the development of a user interface, which can often be time-consuming and unnecessary for automation purposes, our reports were designed to encompass vital assessments supplemented with charts, tables, and assessment narratives. These reports were intended for refinement by validators as needed, streamlining the validation process and ensuring uniformity. It's important to note that this package wasn't intended as a teaching or training tool for basic statistical testing; instead, it aimed to automate the execution of various tests and assessments, offering a comprehensive approach to validation without the need for manual selection based on individual preferences.

Actions: Leading a team of five associates, we meticulously outlined our objectives, pinpointed the problem areas, and envisioned the desired outcome. Acknowledging the constraints of time and resources, I treated this as a supplementary project without compromising our core validation duties. We chose to focus our efforts on developing a prototype tailored for Ordinary Least Squares (OLS) models, owing to their simplicity and broad applicability across diverse modeling domains. Opting for R over Python for its familiarity and its ability to generate LaxTax files for validation reporting, we embarked on crafting a proof of concept.
To maintain cohesion within the team, I emphasized a shared goal and steered clear of allowing individual analytical interests to detract from our progress. While we recognized the potential for this initiative to eventually scale company-wide, our immediate aim was to demonstrate its value within a relatively short time frame of three months. This approach aimed to lay the groundwork for future expansion.

Once everyone was aligned with the project's scope, we meticulously designed key modules and allocated tasks based on individual workloads. Simultaneously, I kept my manager abreast of our progress, ensuring the quality and timely completion of our ongoing validation projects, with reasonable support extended for this initiative as our team's sole focus.
Collaborating closely with developers, I documented the process rigorously to enhance user experience and conducted extensive testing to guarantee quality and reliability.

Result: Within a span of four months, we successfully developed a prototype package capable of generating preliminary validation reports automatically. We shared our breakthrough with the wider validation group and showcased it at internal conferences, attracting attention from key stakeholders, including the MVP and the enterprise Machine Learning (ML) team. This led to fruitful discussions regarding potential integration into their initiatives. We continued to deploy the package wherever applicable, incorporating ongoing maintenance and integrating it with other automation tools for validation purposes.

This experience proved to be transformative for both myself and the team, highlighting the potential for innovation even within the confines of traditionally structured roles like validation. It

underscored the significance of seizing opportunities for improvement and invention in any domain, reaffirming our commitment to driving positive change within our organization.

Scalability

4. Average result recommendation for COVID

Customer obsession
Ownership
Learn and be curious
Insist on the highest standards
Bias for Action
Deliver results
Earn trust

S
Objective of stress testing is to ensure banks keep sufficient capital to weather through economic downturns. From the modeling perspective, the model is used to forecast PD/EAD/LGD given the economic scenarios provided by Fed and BHC themselves on top of borrower attributes (leverage ratio, DSCR, …). The models start to provide unreasonable forecasts with the scenarios in COVID. One of the prominent example is that the model can not take in account the effect from the unprecedented government stimulus, with more than $800B checks went out to Americans through 3 rounds of stimulus (2020Mar, 2020Dec, 2021Mar) on top of stimulus in other forms, e.g. mortgage forbearance, payment deferrals, and assistant program for SB owners. In 2020 CCAR submission,we have to make an amendment on the forecast provided by the models based on the adjusted scenarios from Moodys' in order to reflect the updated economic forecast, as the losses are predicted to be 5x higher under the severely adverse scenario.

Situation: The primary objective of stress testing is to ensure banks maintain adequate capital reserves to endure economic downturns. Models used for stress testing forecast PD/EAD/LGD based on economic scenarios provided by regulatory bodies and banks, along with borrower attributes like leverage ratio and DSCR. However, during the COVID-19 pandemic, models struggled to incorporate the impact of unprecedented government stimulus measures, such as direct payments totaling over $800 billion and mortgage forbearance programs. Consequently, adjustments were necessary during the 2020 CCAR submission, using revised scenarios from Moody's to reflect updated economic forecasts, as losses were expected to rise significantly under severe adverse conditions. The increase in loss projections is attributed to changes in unemployment-related metrics, where models extrapolate relationships between predictors and economic indices not observed in historical data.

The unemployment rate peaked at an unprecedented level, not seen since data collection started in 1948, in April 2020 (14.8%) before declining to a still- elevated level in February 2021 (6.2%) relative to February 2020 (3.5%).

In early April 2020, initial claims for UI benefits surged to roughly 6.2 million in a single week—their largest level on record—because workplaces were shut by lockdown measures put in place to slow the spread of coronavirus. The previous high was 695,000 claims filed the week ending October 2, 1982.

The Consolidated Appropriations Act of 2021, at $900 billion in COVID-related spending and $2.3 trillion in total spending, extended many of the benefits available under the CARES Act and included a refundable tax credit of $600 per family member. It went into effect on Dec. 27, 2020

Task: How to improve models projection and forecasts without significant post model adjustment based on the type of scenarios in COVID.

How can we enhance model projections and forecasts without requiring substantial post-model adjustments, particularly in light of the unique scenarios presented by COVID-19?

What strategies can be employed to enhance models and the projections and forecasts in the context of COVID-19 scenarios, minimizing the need for significant post-model adjustments?

A
First of all, even though the idea of how to deal with this problem is strictly first line model developer's decision, as validation team, I still feel the responsibility and own the decision from my independent thinking on how to solve this problem, especially given the tight timeline. rather than just sit on back seat and let the developers to drive the effort. As we have different experiences, and I could add value and contribute from my owen way, which will not and should not jeopardize the regulatory requirement.

Secondly, I took the approach starting from model usage and the impact from the model output, which is the forecasted losses in the next 9 quarters as defined by the Fed stress test. By focusing on the usage and then track back to the root causes. The key issue is that the

economic scenarios and the correlation with the response variable can generate extreme values. For example, the QoQ change of unemployment initial claim/rate to be 20 to 50 SD away from the historical mean. HOwever, it's a dead end to tell the regulator that hey can you update your scenarios as it is not working well with our models. We have to adapt to this situation. Then How? MD decided not to use unemployment related metrics to avoid hitting on the extreme values, what I tested and then suggested is to instead of rely on one model output which is the traditional approach, we can rely on multiple model output and take the average value as the final forecast. Behind it, it's a similar idea fo ensemble models. I also recognize the potential drawbacks, as it will increase the workload as we need to maintain 3x of models as before. Also, this is unlikely to be a perfect cure. And could lead to a different set of questions form the regulators as we are dealing with different sets of specifications.

I shared the idea, demonstrated the result and the pros and cons to the senior management. They considered it as a viable approach and adopt it to better handle the forecast issues we encountered due to extreme values led by economic scenarios.

Lastly, it is supported by intuition as well. As the economic factors to influence borrowers' repayment ability and losses that the bank may encounter rarely depend on 2 to 3 specific economic drivers. One can come up with different stories to justify the alternative specifications.

Firstly, while the primary decision-making regarding how to address this issue lies with the first-line model developers, as part of the validation team, I felt a sense of responsibility to independently evaluate and contribute to solving the problem, particularly given the tight timeline. It is not the time to watch and make others looked bad, it's the time to do the right thing and take actions to contribute and solve the problem. Rather than passively observing, I recognized the value of my unique experiences and perspectives, ensuring alignment with regulatory requirements.

Secondly, I approached the issue by considering the model's usage and the resulting impact, specifically the forecasted losses over the next nine quarters as defined by the Fed stress test. The challenge lay in the extreme values generated by economic scenarios and their correlation with response variables, such as the QoQ change in unemployment claims deviating significantly from historical norms. For example, the QoQ change of unemployment initial claim/rate to be 20 to 50 SD away from the historical mean. However, requesting scenario updates from regulators was not a viable solution. Instead, I proposed an alternative: utilizing multiple model specifications and the outputs and averaging them to mitigate extreme values. While this approach resembled the ensemble modeling idea, I acknowledged potential drawbacks, such as increased complexity and workload and potential regulatory inquiries into model specifications.

Presenting this idea, along with its results and associated pros and cons, to senior management, it was deemed a viable approach to address forecast issues stemming from extreme economic scenarios.

Lastly, intuition supported this approach, as economic factors influencing borrower repayment abilities and potential bank losses rarely depend on just a few specific drivers. The flexibility of alternative model specifications allows for various narratives to justify their use.

Action:First and foremost, although the primary decision-making authority regarding how to tackle this issue rests with the first-line model developers, I, as a member of the validation team, felt a profound sense of obligation to independently assess and contribute to resolving the problem, especially given the pressing timeline. This was not a time for passive observation or assigning blame but rather an opportunity to take proactive steps and make meaningful contributions to finding a solution. Recognizing the value of my unique experiences and perspectives, I endeavored to ensure alignment with regulatory requirements.

Secondly, I addressed the issue by examining the model's utilization and its resulting impact, particularly focusing on the forecasted losses over the next nine quarters as mandated by the Fed stress test. The crux of the challenge lay in the extreme values arising from economic scenarios and their correlation with response variables, such as the significant deviation of the QoQ change in unemployment claims from historical norms. However, requesting scenario updates from regulators was deemed impractical. Instead, I proposed an alternative approach: leveraging multiple model specifications and their outputs and averaging them to mitigate extreme values. While resembling the concept of ensemble modeling, I acknowledged potential drawbacks, including increased complexity and workload, as well as potential regulatory scrutiny of model specifications.

Presenting this proposal, along with its outcomes and associated advantages and disadvantages, to senior management, it was recognized as a viable strategy to address forecast issues stemming from extreme economic scenarios.

Lastly, I documented the intuition supporting this approach as part of our validation report, as economic factors influencing borrower repayment abilities and potential bank losses seldom hinge on a few specific drivers alone. The adaptability of alternative model specifications allows for various narratives to justify their use.

Result:
Based on the approach I proposed along with other changes made by the MD, we successfully executed stress tests in 2020, 2021, 2022, the 3 most difficult years. The regulatory exams were all satisfactory clean of any MRAs. In addition, not only is this approach effective for stress testing, it is also used for quarterly allowance assessment, so call CECL(Current Expected

Credit Losses accounting standard which is implemented in 2019) models which are quarterly, and based on scenarios as well.

Result: Thanks to the approach I advocated for, along with other adjustments implemented by the MD, we effectively conducted stress tests for the challenging years of 2020, 2021, and 2022. All regulatory exams during this period yielded satisfactory results, free of any Matters Requiring Attention (MRAs). Additionally, the same approach proved beneficial for our quarterly allowance assessments, particularly for CECL (Current Expected Credit Losses) models, which are scenario-based and conducted on a quarterly basis since their implementation in 2019.

Situation: The overarching aim of stress testing within the banking sector is to ensure that financial institutions maintain sufficient capital reserves to weather economic downturns effectively. Typically, stress testing models forecast Probability of Default (PD), Exposure at Default (EAD), and Loss Given Default (LGD) based on economic scenarios provided by regulatory bodies and banks, in conjunction with borrower attributes such as leverage ratio and Debt Service Coverage Ratio (DSCR). However, the onset of the COVID-19 pandemic posed unprecedented challenges for these models, as they struggled to assimilate the profound impacts of government stimulus measures, including direct payments exceeding $800 billion and mortgage forbearance programs. As a result, adjustments became imperative during the 2020 Comprehensive Capital Analysis and Review (CCAR) submission, necessitating the incorporation of revised scenarios from Moody's to reflect updated economic forecasts. This adjustment was critical due to the anticipation of significant increases in losses under severe adverse conditions. Notably, the augmented loss projections stemmed from shifts in unemployment-related metrics, wherein models extrapolated relationships between predictors and economic indices not witnessed in historical data.

Task: The task at hand is to enhance model projections and forecasts without necessitating substantial post-model adjustments, particularly given the unique challenges posed by the COVID-19 pandemic.

How can we refine our models' projection and forecasting capabilities to better accommodate the complexities of COVID-19 scenarios, thereby minimizing the need for significant post-model adjustments?

What strategies can be implemented to bolster the robustness of our models and improve their projections and forecasts within the context of COVID-19 scenarios, with the aim of reducing reliance on extensive post-model adjustments?

Action:First and foremost, although the primary decision-making authority regarding how to tackle this issue rests with the first-line model developers, I, as a member of the validation team, felt a profound sense of obligation to independently assess and contribute to resolving the problem, especially given the pressing timeline. This was not a time for passive observation or assigning blame but rather an opportunity to take proactive steps and make meaningful contributions to finding a solution. Recognizing the value of my unique experiences and perspectives, I endeavored to ensure alignment with regulatory requirements.

Secondly, I addressed the issue by examining the model's utilization and its resulting impact, particularly focusing on the forecasted losses over the next nine quarters as mandated by the Fed stress test. The crux of the challenge lay in the extreme values arising from economic scenarios and their correlation with response variables, such as the significant deviation of the QoQ change in unemployment claims from historical norms. However, requesting scenario updates from regulators was deemed impractical. Instead, I proposed an alternative approach: leveraging multiple model specifications and their outputs and averaging them to mitigate extreme values. While resembling the concept of ensemble modeling, I acknowledged potential drawbacks, including increased complexity and workload, as well as potential regulatory scrutiny of model specifications.

Presenting this proposal, along with its outcomes and associated advantages and disadvantages, to senior management, it was recognized as a viable strategy to address forecast issues stemming from extreme economic scenarios.

Lastly, I documented the intuition supporting this approach as part of our validation report, as economic factors influencing borrower repayment abilities and potential bank losses seldom

hinge on a few specific drivers alone. The adaptability of alternative model specifications allows for various narratives to justify their use.

Result:
Based on the approach I proposed along with other changes made by the MD, we successfully executed stress tests in 2020, 2021, 2022, the 3 most difficult years. The regulatory exams were all satisfactory clean of any MRAs. In addition, not only is this approach effective for stress testing, it is also used for quarterly allowance assessment, so call CECL(Current Expected Credit Losses accounting standard which is implemented in 2019) models which are quarterly, and based on scenarios as well.

Result: Thanks to the approach I advocated for, along with other adjustments implemented by the MD, we effectively conducted stress tests for the challenging years of 2020, 2021, and 2022. All regulatory exams during this period yielded satisfactory results, free of any Matters Requiring Attention (MRAs). Additionally, the same approach proved beneficial for our quarterly allowance assessments, particularly for CECL (Current Expected Credit Losses) models, which are scenario-based and conducted on a quarterly basis since their implementation in 2019.

Situation: In the banking sector, stress testing serves as a critical tool to ensure financial institutions maintain robust capital reserves, thus enabling them to withstand economic downturns effectively. Traditionally, stress testing models forecast key metrics such as Probability of Default (PD), Exposure at Default (EAD), and Loss Given Default (LGD), utilizing economic scenarios provided by regulatory bodies and banks, in conjunction with borrower attributes such as leverage ratio and Debt Service Coverage Ratio (DSCR). However, the onset of the COVID-19 pandemic posed unprecedented challenges to these models, as they struggled to accommodate the profound impacts of government stimulus measures, including direct payments exceeding $800 billion and mortgage forbearance programs. Consequently, adjustments became imperative during the 2020 Comprehensive Capital Analysis and Review (CCAR) submission, necessitating the incorporation of revised scenarios from Moody's to reflect updated economic forecasts. This adjustment was particularly critical due to the anticipation of significant increases in losses under severe adverse conditions. Notably, the augmented loss projections were a consequence of shifts in unemployment-related metrics, wherein models extrapolated relationships between predictors and economic indices not observed in historical data.

Task: The primary objective at hand is to enhance the projection and forecasting capabilities of our models without necessitating significant post-model adjustments, especially given the unique challenges posed by the COVID-19 pandemic.

Action: Firstly, recognizing the primary responsibility of first-line model developers in addressing this issue, I, as a member of the validation team, felt compelled to independently assess and contribute to resolving the problem, especially given the

urgency of the situation. This called for proactive engagement rather than passive observation or assigning blame, with a focus on aligning our efforts with regulatory requirements.

Secondly, I undertook a thorough examination of the model's utilization and its resulting impact, with a specific focus on forecasted losses over the next nine quarters, as mandated by the Fed stress test. The crux of the challenge lay in extreme values arising from economic scenarios and their correlation with response variables, such as the significant deviation of the QoQ change in unemployment claims from historical norms. Recognizing the impracticality of requesting scenario updates from regulators, I proposed an alternative approach: leveraging multiple model specifications and their outputs, and averaging them to mitigate extreme values. While resembling the concept of ensemble modeling, I acknowledged potential drawbacks, including increased complexity and workload, as well as potential regulatory scrutiny of model specifications.

Presenting this proposal, along with its outcomes and associated advantages and disadvantages, to senior management, it was recognized as a viable strategy to address forecast issues stemming from extreme economic scenarios.

Lastly, I meticulously documented the intuition supporting this approach as part of our validation report, emphasizing that economic factors influencing borrower repayment abilities and potential bank losses seldom hinge on a few specific drivers alone. The adaptability of alternative model specifications allows for various narratives to justify their use.

Result: Thanks to the approach I advocated for, along with other adjustments implemented by the MD, we effectively conducted stress tests for the challenging years of 2020, 2021, and 2022. All regulatory exams during this period yielded satisfactory results, free of any Matters Requiring Attention (MRAs). Additionally, the same approach proved beneficial for our quarterly allowance assessments, particularly for CECL (Current Expected Credit Losses) models, which are scenario-based and conducted on a quarterly basis since their implementation in 2019.

5. CECL modeling approach recommendation

Deliver results
Think big
Are right, a lot
Learn and be curious

S

T

A

R

6. Validation timeline management

Situation:
I worked in a model validation team to cover commercial loss forecasting, which are the models used for stress tests, allowance assessment and business applications. For both stress test and allowance assessment related validation projections, the deadline is non-negotiable, simply due to the strict deadline for CCAR submission and quarter financial reporting. The entire stress testing submission is a complex process involve a stream of teams to work together. Each year our model development team could change from 5 to 10 models from entire model rebuild to apply minor model changes. Regulators requires us to validate any model changes big or small and make our independent risk assessment, which are subject to regulatory exam each year. It's a stressful process and high pressure as well. There is a tendency that Modelers would like to spend more time to build the model where the time left for validation can be shortened. Our entire team often struggles during the time period to get a lot of things done and deliver work on time with high quality. NO need to say we need to communicate with Model developers as well as senior management regarding the key model risks we identified, to gain consensus and receive their remediation plans. This process often requires iterative back and forth communications. Where everybody is busy on top of that a number of key holidays and vacation schedule can make it really difficult to even find the time where key attendants are available. The meeting scheduling can be a stresser on its own.

In addition, model developers have a tendency to delay their deliveries multiple times over the course. Often started with a couple of delays, then migrated to major delays extending to a month or two.

Task:
There is need to improve this stressful situation and reduce the risks of delays and disruptions.

Actions:
I took the lead to come up with a reasonable projection management process aiming to increase transparency and efficiency between the model development team and the validation team.

For example, I managed 10+ projects in the 2021 stress testing cycle. With 5 internal validation resources and 4 external resources. A good project planning from my end is not good enough. As the validation time is not independent. It is often affected by modelers' delivery timeline and commitment. So after socializing with the Modeling team lead and our teams, I proposed a new process to better connect these 2 teams. Firstly, early planning. We communicate with the modelers right after the Fed exam, where MD can incorporate Fed feedback to decide the modeling activities. Secondly, we break down each model changes by sub stages, and rely on jira and google sheet to set up committed deliveries for both team. So it's a two way street system and we can audit each other over time. Thirdly, each commitment as well as delay will require VP signoff with clear downstream consequences discussed for management to consider. It's alway a tradeoff and balanced decision. We established this system in April.

Results:
This system is implemented and helped better coordinate and better collaboration with clear and transparent responsibilities and the reason for each key decision point.

Situation:
I was part of a model validation team responsible for assessing commercial loss forecasting models used in stress tests, allowance assessments, and various business applications. The deadlines for stress tests and allowance assessments were non-negotiable, primarily due to the stringent timelines for CCAR submissions and quarterly financial reporting. The stress testing submission process was intricate, requiring collaboration among multiple teams. Each year, our model development team underwent model changes, ranging from entire model rebuilds to minor adjustments. Regulatory mandates required us to validate any model changes, big or small, and conduct independent risk assessments, subject to regulatory scrutiny annually. This process was inherently stressful and high-pressure, compounded by the time constraints and the need to communicate key model risks to model developers and senior management for consensus and remediation plans. The scheduling of meetings was particularly challenging, exacerbated by the busy schedules and vacation plans of key stakeholders.
Furthermore, model developers often exhibited a pattern of delaying their deliveries, starting with minor delays and escalating to significant delays of up to a month or more.

Task:
There was a pressing need to mitigate the stress and reduce the risks of delays and disruptions in the validation process.

Actions:

1. **Developing a Projection Management Process: I spearheaded the development of a comprehensive projection management process aimed at enhancing transparency and efficiency between the model development and validation teams.**
2. **Early Planning and Communication: Recognizing the interdependence between validation timelines and modelers' delivery commitments, I advocated for early planning and communication. Following the Fed exam, we engaged with the modelers to incorporate feedback and decide on modeling activities.**
3. **Breakdown and Commitment Tracking: We instituted a system of breaking down each model change into sub-stages and tracking committed deliveries using tools like Jira and Google Sheets. This two-way street approach allowed for mutual accountability and enabled us to monitor each other over time.**
4. **Signoff and Consequence Discussion: Each commitment or delay required signoff from the VP, accompanied by a discussion of clear downstream consequences for management consideration. This ensured that decisions were balanced and made with full awareness of their implications.**

Results:
The implemented system significantly improved coordination and collaboration between the model development and validation teams. Clear and transparent responsibilities, along with discussions surrounding key decision points, fostered a more efficient and streamlined validation process.

7. Validation finding principle

Ownership
Customer obsession
Dive Deep

S
T
A
R

8. Modeling strategy development

Situation:
Transitioned from model validation group to Card intelligence, which is the core model development team, then analytic engine to drive business for credit card business. From 2nd line of defense team to the 1st line modeling responsibilities. Lesser regulatory scrutiny and to

be closer to the core business and strategic decisioning. Higher regulatory scrutiny limited the innovation to some extent for a good reason. Banks want to be cautious and thorough in terms of adopting new methodologies especially before it's been popularized and well understood. As the risks of failing are a lot higher. In short, it's not the environment to thrive through learning by trying.

After I joined the team I realized that my role has been changed completely, from something more tangible to intangible. Feature engineering for the next gen customer management risk models.

Task
What do I do when the job description changes completely while I'm in a new team.

Action:
Firstly, I decided not to give it up. I want to face the challenge and figure out a way to tackle the new task.

Secondly, I have to build the team myself, quickly, I have 2 direct reports in the new team and I hired them within 4 months.

Thirdly, I had an open and honest conversation with my manager, and our MVP. Being authentic has been my core principle. I know my strengths and weaknesses, and the reason to have an honest discussion is not looking for excuses or venting frustrations, instead, I look for all the help I can get and guidance from them. In addition, I carefully positioned my team, all 3 of us are new to the team and the models, as I am responsible for their growth and success. I want to provide them with transparency and clarity on their individual responsibilities and on each assignment. For example, I positioned my team from 2 key dimensions, one is to provide technical support, i.e. opportunities/impact analysis to justify and support the strategic initiatives with solid data points, and analytics. On the other hand, I also looked for chances to connect with the business team frequently, through strategy communication meetings and 1 on 1 meetings to search where we can add value to improve the credit policy and make faster and better decisions while increasing customer experience.

Fourthly, I also enhanced my knowledge in terms of building credit modeling strategy. The key steps as well as what is the end product and who are the key audiences I need for convenience. I started to host a series of meetings with different group peer teams, including modeling groups for customer life cycle (acquisition, customer management, risk, valuation models, marketing and fraud team as well), business team for different customer segments, data management team, technology team, not only the team leader, as well as mid-level and junior associates. To hear their voices in terms of the challenges they are facing and the areas to improve. This multidimensional approach has been very helpful. I started to fill in the voi in my mind and build a structure for our team.

Finally, I also build a feedback loop to fine toning and adjust the framework and the content.

Results:
I shared with our team and our leader the strategy we built. It is a long term strategy with short to mid term objectives. So we will make incremental improvements, all aiming towards the direction we agreed upon. I also proposed to set up a 'monitoring' or reassess mechanism in order to make adjustment when it's needed. Like building a model, it's not a done job or fixed product. We have to be forward looking and be flexible and willing to change or either slow down or speed up when necessary.

Situation:
I transitioned from the model validation group to Card Intelligence in 2022, the core model development team for driving business in the credit card sector. The major motivation is to shift aways from a 2nd line of defense role to 1st line modeling responsibilities, so I can be closer to core business operations, modeling and credit decision-making. In addition, the innovation room is limited to some level due to regulatory scrutiny, given the higher risk associated with using untested methodologies. Initially my role is to focus on feature engineering to build the next gen risk model faster and have better performance. However, shortly after I joined the team, the role changed to build credit modeling strategy.

Task:
What should I do? How do I adapt to a completely altered job description in a new team and to succeed?

Action:

1. Embraced the challenge and resolved to find solutions rather than giving up. I recognized the rare opportunity to build a modeling for the core business. This is the skill I want to learn and add to my skill set. So I can be a well-rounded data scientist.
2. Rapidly built my team, hiring two direct reports within four months. After talking with my manager, I decided not to fill the 3rd open rack. Expanding a team in a new environment is not my objective. Do more with less.
3. I also focused on my team's success and growth. Positioned the team strategically, emphasizing transparency, clarity, and individual growth. For example, I intentionally positioned my team as the analytic force to provide any analysis that are needed to justify or sizing the impact to the proposed initiatives as part of the strategy building. In addition, I also connected with business team frequently to understand their near term needs to leverage analytics to drive business insights and better informing credit policy.
4. Initiated open and honest conversations with my manager and the MVP, seeking guidance and support in terms of how to be successful in a strategy role as a data

scientist. What are the problems to solve? What is the result my bosses are looking for? These are my north star and guiding principle.
5. Enhanced knowledge in credit modeling strategy, hosting meetings with various peer teams and stakeholders to gather insights and build a comprehensive framework.
6. Established a feedback loop for continuous improvement and adjustment.

Results:
It turned out to be one of the most valuable experiences in my career.

Shared a long-term strategy with short to mid-term objectives with the team and leaders. Proposed setting up a monitoring mechanism for ongoing assessment and adjustment. The approach aims for incremental improvements aligned with agreed-upon goals, emphasizing adaptability and forward-looking flexibility.

Situation:
In 2022, I underwent a significant professional transition, moving from the model validation group to Card Intelligence, the core model development team responsible for driving business in the credit card sector. The primary impetus behind this move was to pivot from a 2nd line of defense role to 1st line modeling responsibilities, enabling me to immerse myself in core business operations, modeling intricacies, and credit decision-making processes. However, this transition also meant navigating within a regulatory environment that imposed constraints on innovation, necessitating a cautious approach due to the inherent risks associated with untested methodologies. Initially tasked with focusing on feature engineering to expedite the development of next-generation risk models with enhanced performance metrics, my role swiftly evolved to encompass the strategic aspect of building credit modeling strategies.

Task:
The challenge at hand was to adapt to a substantially altered job description within a new team and devise a pathway to success in this transformed role.

Action:
1. **Embracing the Challenge: Rather than succumbing to apprehension, I embraced the challenge as an unparalleled opportunity to broaden my skill set and contribute meaningfully to the core business. Recognizing the importance of becoming a well-rounded data scientist, I resolved to navigate this transition with a proactive mindset.**

2. **Rapid Team Building: With an acute awareness of the demands of my new role, I swiftly assembled a dedicated team, hiring two direct reports within a span of four months. Consciously opting for quality over quantity, I refrained from filling the third open position, prioritizing efficiency and productivity in a new environment.**
3. **Focus on Team Success and Growth: I strategically positioned my team as the analytical backbone, emphasizing transparency, clarity, and individual growth. By fostering a culture of openness and collaboration, I ensured that my team was well-equipped to provide the analytical support necessary to justify initiatives and inform strategic decisions. Additionally, I proactively engaged with the business team to gain insights into their immediate needs, leveraging analytics to drive business insights and enhance credit policy formulation.**
4. **Open and Honest Communication: Initiating candid conversations with my manager and key stakeholders, including the MVP, I sought guidance and support in navigating this strategic role as a data scientist. Clarifying the problems to solve and understanding the desired outcomes served as my guiding principles, enabling me to align my efforts with organizational objectives effectively.**
5. **Enhanced Knowledge Acquisition: Recognizing the criticality of mastering credit modeling strategy, I organized and facilitated meetings with various peer teams and stakeholders to glean insights and construct a comprehensive framework. These interactions proved instrumental in augmenting my understanding and refining my approach to building effective credit modeling strategies.**
6. **Establishment of Feedback Loop: To ensure continuous improvement and adaptability, I instituted a robust feedback loop, facilitating ongoing assessment and adjustment. This iterative approach allowed for incremental enhancements aligned with our long-term strategy and short-to-mid-term objectives, fostering adaptability and forward-looking flexibility.**
7.

Results:

This transformative journey proved to be one of the most enriching experiences of my career, yielding tangible outcomes and invaluable insights. By sharing a long-term strategy with short-to-mid-term objectives with the team and leaders, I facilitated alignment and clarity of purpose. Moreover, by advocating for the implementation of a monitoring mechanism, I ensured ongoing assessment and adjustment, underscoring the importance of adaptability and foresight in driving sustainable success.

9. Technology and Data challenges

10. Build a culture committee including 4 subcommittees

11. Build a culture committee including 4 subcommittees

TensorFlow