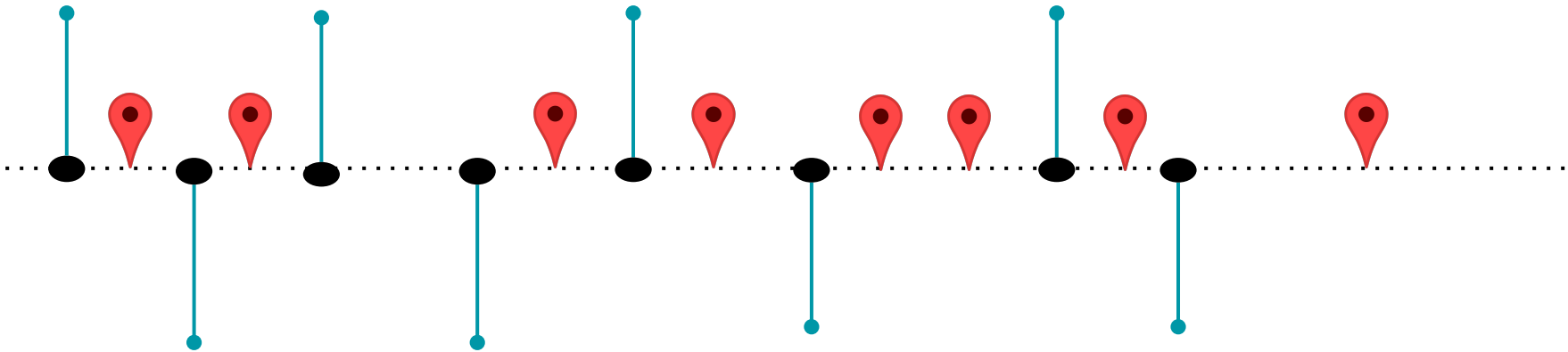

Sushant Joshi

Bachelors Of Engineering
University of Pune
2002 - 2006

Masters in Distributed Systems
SJSU, CA
2009 - 2010

Sr Software Engineer
Walmart, CA,
2012 - 2014

Masters in Data Science
UC Berkeley, CA
2021 - 2023

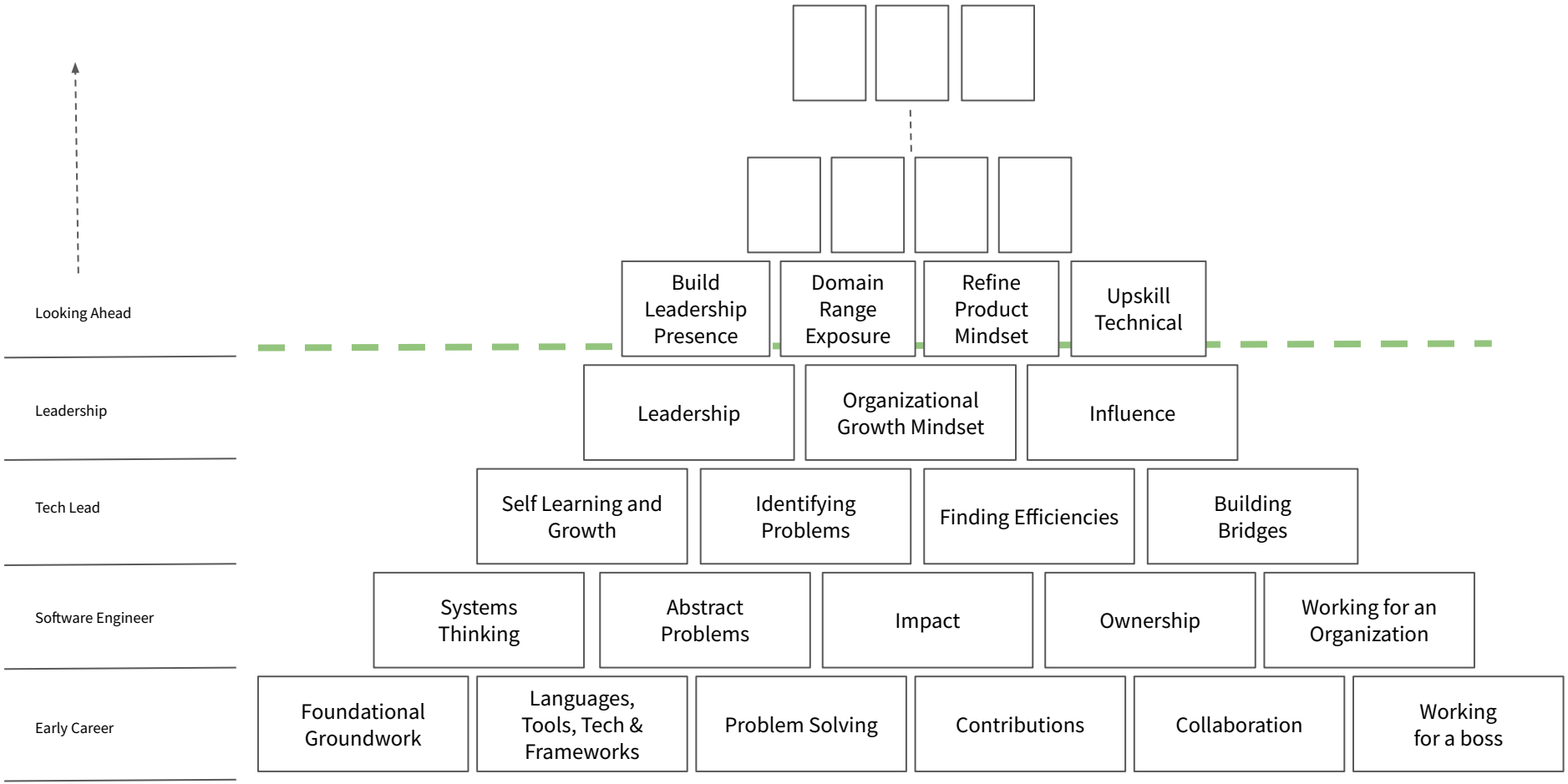


Software Engineer
TechM, India,
2006 - 2008

Software Engineer
Yahoo, CA,
2010 - 2012

Staff Software Engineer
Walmart, CA,
2014 - 2019

Principal Software Engineer
Walmart, CA,
2019 - 2024


Looking Ahead
Build Leadership Presence
Domain Range Exposure
Refine Product Mindset
Upskill Technical
Leadership
Leadership
Organizational Growth Mindset
Influence
Tech Lead
Self Learning and Growth
Identifying Problems
Finding Efficiencies
Building Bridges
Software Engineer
Systems Thinking
Abstract Problems
Impact
Ownership
Working for an Organization
Early Career
Foundational Groundwork
Languages, Tools, Tech & Frameworks
Problem Solving
Contributions
Collaboration
Working for a boss

Work Portfolio

- Personalizing E2E Customer Journey
  - Homepage, Search, Product Page, Cart, Checkout, Post Transaction
  - General Merchandise and Grocery Platform
- Customer Preferences and Understanding
  - Implicit and Explicit Preferences
  - Historical Context and Session Context
  - Brand, Price, Category, Seller Preferences, Delivery Methods
  - Build and Leverage Customer Persona
- Trifecta of Search, Ads and P13N
  - Competing priorities and KPIs
  - Lift, CTR, ATC, Conversion, AOV, CLTV, CPC, ROAS
- Collaboration
  - Product | Program | Software Engineers | Data Science | Data Engineering | Business | Customers / Clients | Quality Assurance | Technical Leads | Architects | Leadership | Management | Engineering Partners | Front End

- 12 BFCM
  - Zero Downtime
  - Within SLA
  - Scalable API
    - on-prem
    - Hybrid
    - Public cloud
- Unified Personalization API
  - Multi-Tenant API
- Grocery Personalization
  - Smart Substitutions
    - Post Transaction Recommendations
    - Built a novel A/B Testing Framework
  - Predictive Basket Experience
    - Customer's Perception and Impact
    - High Precision for Recommendations
  - Infinite Scroll
- My First Data Science Model
  - Cosine, Jaccardian, Hamilton
- Getting a direct report out of PIP

Deep Dive

Grocery Personalization

Smart Substitutions, Predictive Basket, Favorites, Dynamic Ranking and Infinite Scroll, Similar and Complementary Products, Stock Up, Reorder Your Essentials, Unified API, Sponsored Ads, Search Reranking

Streamlining ClickStream

Re-design and re-implement the clickstream data consumer flow to close significant gaps in Attributions and Model Feedback.

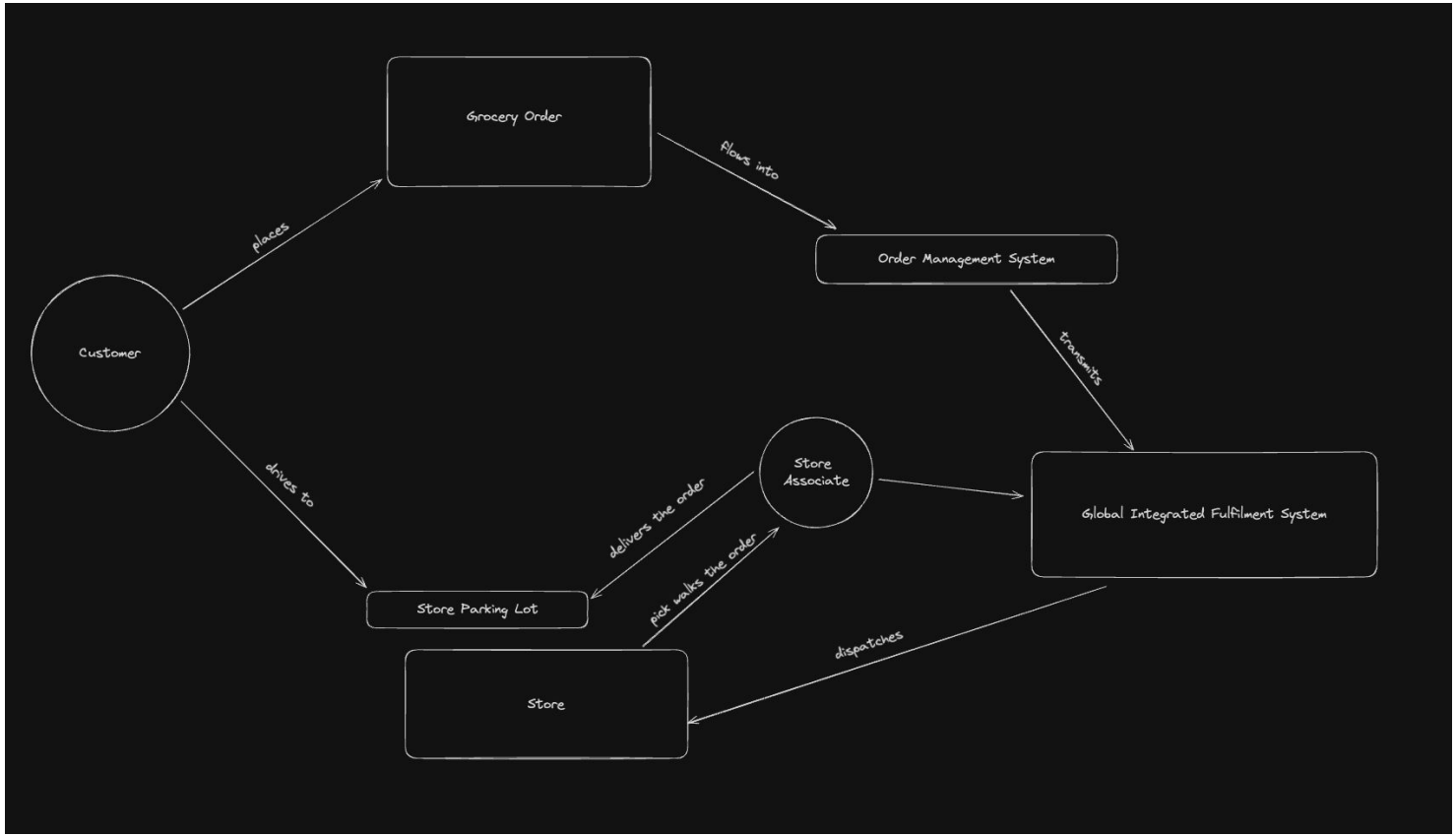
International Markets

Extending personalization platform to onboard international markets - Canada and Brazil on to a Unified Platform.

Grocery Use Case : Context

- Responsible for E2E Customer Journey across several touch points - specifically personalization on Homepage, Product Page, Favorites, etc for **Online Grocery** Use Cases.
- Touch 45%+ of Online Grocery Revenue
- Online Grocery Customers
    - are repeat Customers
    - are also the most loyal customers
    - shop for their weekly/biweekly grocery needs
    - are budget sensitive
    - are brand sensitive
    - are intolerant to certain consumable products (Vegan, Lactose Intolerant)
- Cannot recommend “Vitamin-D Milk from Horizon” brand to someone who regularly buys “2% Homogenized Milk from Great Value” brand
    - Brand Mismatch
    - Ingredients Mismatch
    - Price Mismatch

Grocery Use Case : Context



Challenges with Manual Substitution

- 65% of the orders needed to be substituted
- 10,000+ store associates fulfilling 80 orders each hour across 4600 stores
- Based on a rules written in a notebook
- Open to interpretation
- No checks if rules are being followed
- Personal, Regional and Cultural Biases
- Should I replace 1 Gallon of 2% Homogenized Milk with 2 half Gallons of 2% Homogenized Milk ?
- Result
  - 85% of those manually substituted items were rejected (High Rejection rate: 85%)
  - Lost Revenue
  - Poor Customer Experience
  - Lost Customer Trust
  - Lost Associate Trust
  - Financial Loss

My responsibility

Investigate an existing Substitutions API managed by a different team

- API is working, but the models powering the API are stale and orphaned.
- Recommendations had TTLed out of the database
- Recommendation coverage was < 1%
- My data engineering team found that there is no trace of the data sources or the pipelines and where they are running
- No proper handover was possible
- API was designed to provide Recommendations but no personalization

In-Store Insights and Strategic Decisions

- We went for a store walk to understand the pain points of the Store Associate
- They did not use the application at all because - **“It just does not work”.** The associates found the application unhelpful.
- **[Decision]** Given these challenges, I helped establish that rebuilding the smart substitutions service from the ground up, redefine interfaces with our client system (GIF), and establish a clear timeline for service availability and launch in this case was most beneficial.
- **[Decision]** I drove getting an alignment from Business and Product teams for an initial launch in one store within three months, followed by a broader rollout.

Strategic Decisions

Actions

- Rebuild the smart substitutions service from the ground up
- Redefine the interfaces with our client system called GIF
- Agree on a timeline for the service availability & work on a launch plan
- Alignment from Business and Product to launch in 1 store 3 months away with a broader rollout plan.

Challenges and Cross-Functional Collaboration

- Turns out that the GIF systems have a much longer roadmap prioritization - because GIF supports all software stores (Store Software Systems like POS, handheld devices, Schedulers, etc), they plan multiple quarters in advance.
- GIF team was unable to commit to making any changes at all for at least 2 quarters.
- This became a bottle neck for us and my product and business organizations were not happy.
- Top level conversations were required in this case and I proposed an interim solution
    - My team would spin up an endpoint with the API interfaces exactly similar to the existing - Requests, Responses, endpoints, with an only change in the FQDN.
    - For the rest we would write Adapters to map the legacy smart subs service to the unified service that we owned
    - We requested them to plan for a configuration change across 1 store.
    - Once they identified and confirmed that this is possible, this major hurdle was bypassed for initial launch
- More Challenges

More Challenges

- Product team came up with a requirement that they would like to also have a few hypothesis run as an experiment
  - Does price sensitivity of the customer impact substitute rejection.
  - How does a sub-down only impact substitute rejection.
- Unlike in the discovery flow on our website, this flow through GIF did not support experimentation.
- I took that as an opportunity and designed an A/B testing framework on the Personalization Layer
  - It took a few iterations to get it right. Thinking about biases due to improperly partitioned control and variant buckets took me some time to understand and incorporate in the design and implementation.
  - This A/B testing framework ended up getting an approved patent.

Impact and Outcome

- We launched the Smart Subs service ahead of schedule.
- First launch to 1 store was a success
- We integrated with our first Associate facing Store Systems use case
- Launched to 50 stores in the next quarter.
- 1400 stores ramp followed in the next quarter, Launched nationwide as a quick follow up.
- The substitute **rejection rate** decreased significantly **from 85% with manual substitutions to 5% with AI/ML driven solution** at the nationwide launch, showcasing the substantial impact of our efforts.
- I was invited to give a presentation about this project at -
    - CTO level All Hands
    - Company wide All Hands

Note: Associate adoption after the initial ramp of the substitutions capability took longer time than we had anticipated. It required trainings for the store associate, before they started trusting the API and using the capabilities.

Learnings

- Throughout this initiative, I learned the importance of rebuilding trust, which requires time and consistent effort.
- Additionally, thorough planning for contingencies is crucial for navigating unforeseen challenges and ensuring project success.

Thank You