

Competitive Price Prediction (CPP)

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☰ Author	
☰ Assignment	



Table of Content

[About Me](#)

[Challenges](#)

[Vision Computing](#)

[Problem Statement](#)

[Personas for Vision Computing](#)

[Prototype](#)

[Predict](#)

[Machine Learning Pipeline](#)

[Digital Price Tag Automation](#)

[Inside Vision Computing \(AI\)](#)

[Database Engineering](#)

[Problem Statement](#)

[Personas for Database Engineering](#)

[Database Management Functional Framework \(DMBok\)](#)

[Machine Learning Operations \(MLOps\) Life Cycle](#)

[Product Road Map](#)

[Financial](#)

About Me

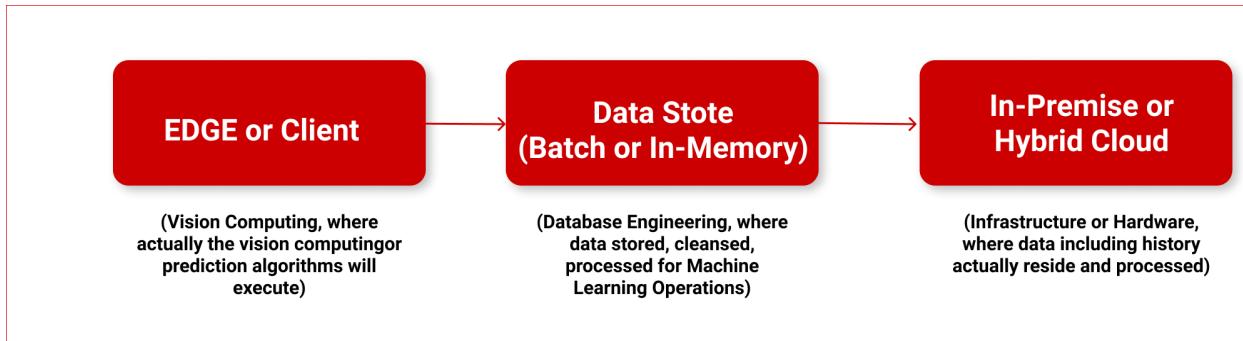
I am a technologist turned **AI Product Manager** with proven skills in **tech, data, design, product, agile, leadership, strategy, and culture**, as well as a passion for building products that customers want to buy. While building the product from ideas, I enjoy constantly raising the bar on **functionality, flow, consistency, usability, and simplicity**. **Passion, rigour, and compassion** are just a few of the qualities that I believe have aided my development as an outstanding AI product leader. I seek out opportunities to meet with customers, understand their problems and needs, and build solutions based on customer insights, all while sharing my knowledge with my product community.

Challenges

For Vision Computing (LPO): Competitive Pricing - Leverage Vision Computing to validate Target Items against competitors to achieve pricing match.

For Database Engineering (LPO): Competitive Pricing - Leverage Vision Computing to validate Target Items against competitors to achieve pricing match. Focus on the Database aspects for the product and help figure the best.

I worked on both the problem statements as both the problem statements **Vision Computing** and **Database Engineering** are related, dependent problem statements and go hand in hand.



Vision Computing

Problem Statement

How might we improve the Target's profitability and market competitiveness by optimising the pricing on-time of each product across Target stores?

Personas for Vision Computing

Lisa - The Global Lead Pricing Executive



"Target Pricing is a pricing strategy in which the selling price of the product or service is determined first and then the cost is calculated by reducing the profit margin"

Demography

Age: 35

Work: Global Pricing Executive

Family: Married (two kids)

Location: New York, United States

Character: Influencer

Attributes

Pricing Expert

Influencer

Analytical

Good Negotiator

Conflict Management

Emotional Intelligent

Lisa is a global Lead Pricing Executive working at Target. She lives with her family and two kids.

As a global Pricing Executive, she works with her global team and data scientist to determine pricing schemes for a company's products. Lead and direct pricing strategy formulation along with Data Scientists and take necessary pricing actions to enhance profitability, ensuring integrity and accuracy in all pricing matters. She also assists with pricing negotiations of customers' proposals at the global level.

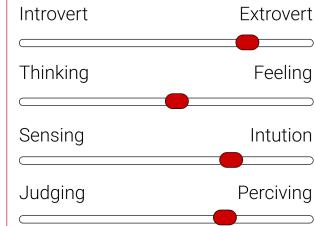
Goals

- Keeping both demand and profits as high as can be.
- Create the pricing strategy (i.e. premium, skimming, economy or value and penetration, etc) to beat the competition.
- Attract and retain customers through competitive pricing.
- Increase foot fall and Minimize churn.

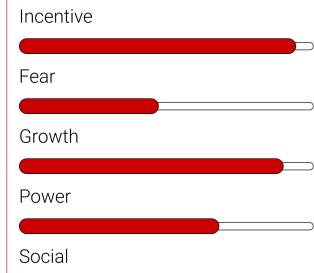
Frustations

- Setting daily price for millions of products at 1,915 stores and 46 distribution centers in the U.S and More than a dozen sourcing offices globally.
- Dynamic Pricing and cutthroat competition.

Personality



Motivation



Steve - The Lead Data Scientist



"Target Pricing Prediction is pricing tactic in which the selling price of the product predicted accurately on daily basis fto stay ahead in the competition and make Target profitable"

Demography

Age: 45

Work: Senior Data Scientist

Family: Married (two kids)

Location: Target Headquarter

Character: Influencer

Attributes

Intuitive	Curious	Analytical
Retail Domain Expert	Pricing Expert	AI Expert

Steve is Senior Data Scientist part of global Pricing team working at Target. He lives with his family.

As a Lead Data Scientist his roles is to work with his data science team to to accurately predict pricing schemes for a company's products. Lead and direct pricing strategy formulation along with Data Scientists and pricing team and take necessary pricing actions to enhance profitability, ensuring integrity and accuracy in all pricing matters. He and his team roles is to write the AI algorithms and also closely working with database engineering team to acquire, cleanse the required data from various sources in multiple formate to train and model to acurately predict the pricing of each Target products.

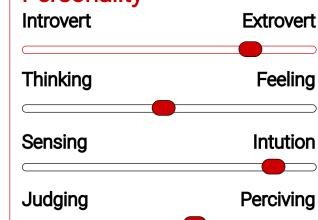
Goals

- Subject matter expert in data science pricing predictive modeling and retail domain.
- Create the pricing strategy along with global pricing executive team (i.e. premium, skimming, economy or value and penetration, etc) to beat the competition.
- Work with database engineering tear to ensure data quality.

Frustations

- Ensuring Data Quality and Data Security.
- Daily on-time accurate pricing predictions of millions of product across locations.
- Collaborate with cross functional team across location.

Personality



Motivation

Incentive



Fear



Growth



Power



Social



Prototype

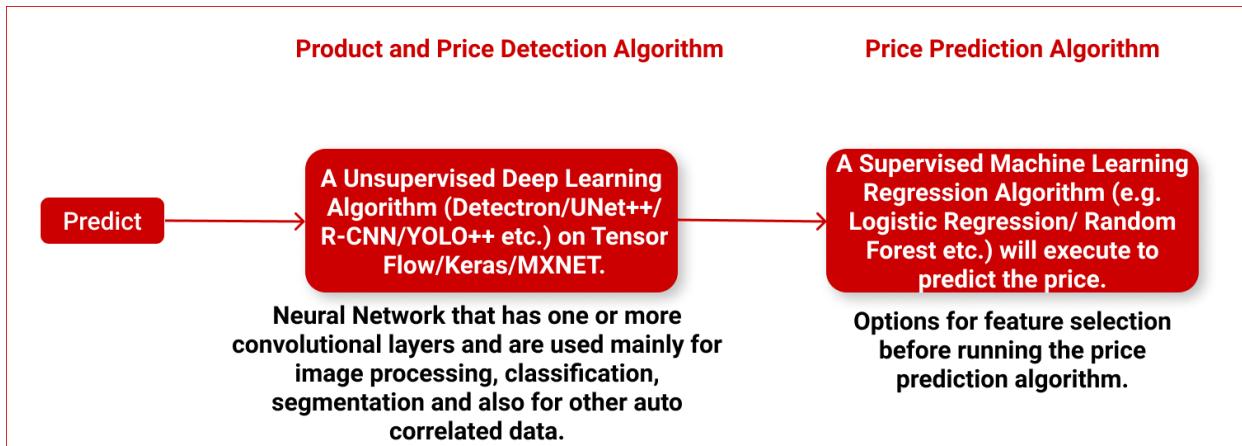
https://www.figma.com/embed?embed_host=notion&url=https%3A%2F%2Fwww.figma.com%2Fproto%2FsU05k66fND6MzgRQqv5Fg3%2FCompetitive-Price-Prediction%3Fpage-id%3D0%253A1%26node-id%3D201%253A173%26viewport%3D241%252C48%252C0.5%26scaling%3Dscale-down%26starting-point-node-id%3D201%253A173

Predict

When user select an item and click on predict, behind a pricing engine (set of deep learning and machine learning algorithms will trigger through data-pipeline and model-pipeline) monitor competitor prices in real-time. It then sorts them out and compares them to similar products, depending on the wide range of attributes selected (e.g.

location, seasonality, demand, supply, local taxes, delivery time etc.), and ultimately optimise prices.

Machine Learning Pipeline



Digital Price Tag Automation



Inside Vision Computing (AI)

At the heart of Vision Computing (AI) is machine learning (ML), a process that has the ability to learn on its own without being explicitly programmed. Machine learning uses data to detect patterns in data and adjust actions accordingly so that, when it's exposed to new data, it develops programs that adapt to that information. ML algorithms are closely related to a number of computational methods, such as computational statistics and mathematical optimisation. ML is a standard method used to create complex algorithms that possess predictive powers and predictive analytics, a number of analytical models that uncover insights through learning from trends and historical information in the data set.

Database Engineering

Problem Statement

How might we enable data scientists, data engineers, and cloud administrators by providing an efficient environment and high-quality data on-time to pre-process the data, train, and validate deep learning (vision computing) and machine learning (prediction) algorithms, allowing them to improve Target's profitability and market competitiveness by optimising the pricing of each product across Target stores?

Personas for Database Engineering

Raj - The Data Engineer



Attributes

Intuitive	Curious	Analytical
Strong Data Skill	Big Data Specialist	Data Engineering

Raj is a Data Engineer part of Target Technology Service team working at Target, Bangalore.

As a Data Engineer his roles is to work with his data science and cloud admin team to to acquire, process, cleanse, secure and maintain data with high quality.

"Target Infrastructure & Operations is the digital root system of Target Technology Service. Our power lies in both anchoring target business operations and fueling its competitive edge"

Demography

Age: 28

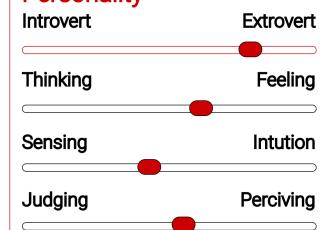
Work: Senior Data Engineer

Family: Single

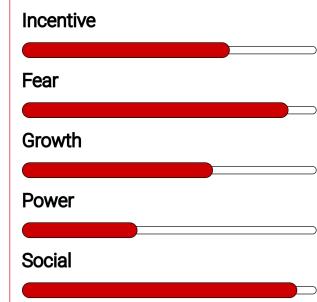
Location: Bangalore

Character: Innovator

Personality



Motivation



Goals

- Subject matter expert in retail domain and data engineering.
- Work with database engineering to ensure data quality an high availability.

Frustations

- Ensuring Data Quality and Data Security.
- Daily on-time accurate pricing predictions of millions of product across locations.
- Collaborate with cross functional team across location.

Amit - The Cloud Administrator



"Target Infrastructure & Operations is the digital root system of Target Technology Service. Our power lies in both anchoring target business operations and fueling its competitive edge"

Demography

Age: 30

Work: Cloud Admin

Family: Married

Location: Bangalore

Character: Innovator

Attributes

Intuitive	Curious	Analytical
Strong Coding Skills	Database Specialist	Cloud Specialist

Amit is a Cloud Administrator part of Target Technology Service team working from Bangalore.

As a Cloud Administrator his roles is to work with his data science and data engineering team to secure and maintain data and infrastructure efficiently with minimum down time.

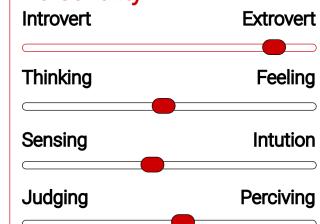
Goals

- Subject matter expert in data science pricing predictive modeling and retail domain.
- Work with database engineering tear to ensure data quality.

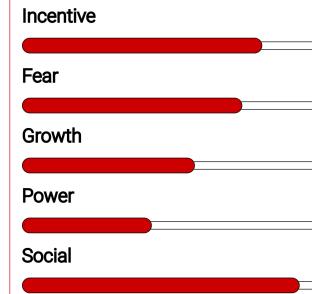
Frustations

- Ensuring Data Quality and Data Security.
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Personality



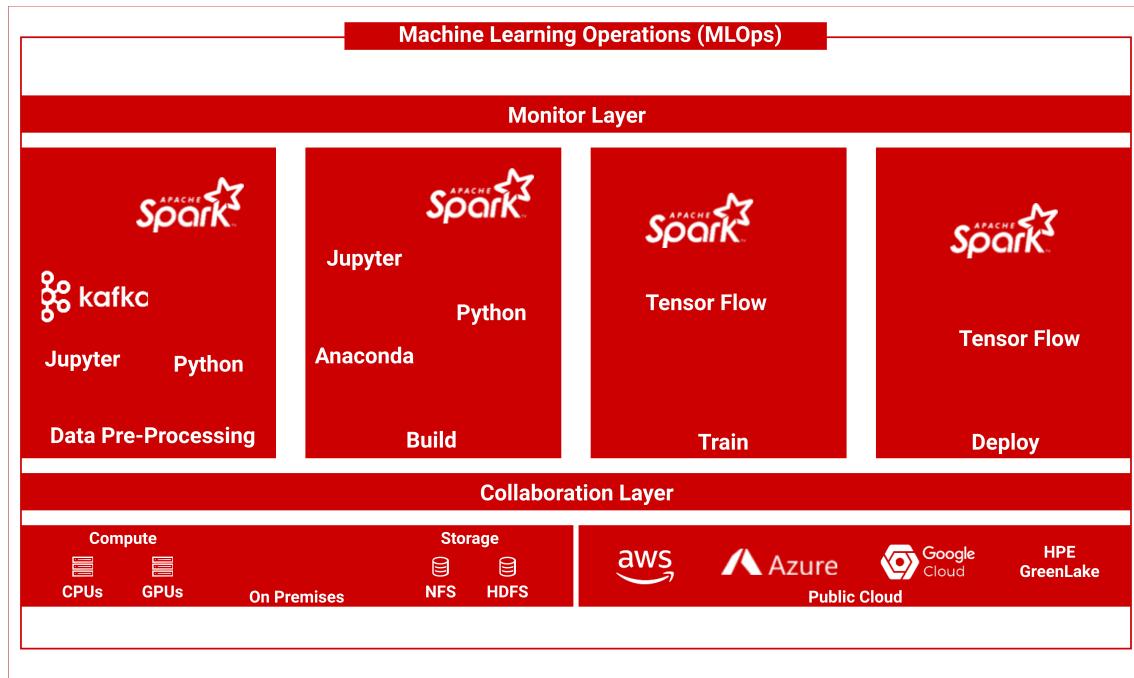
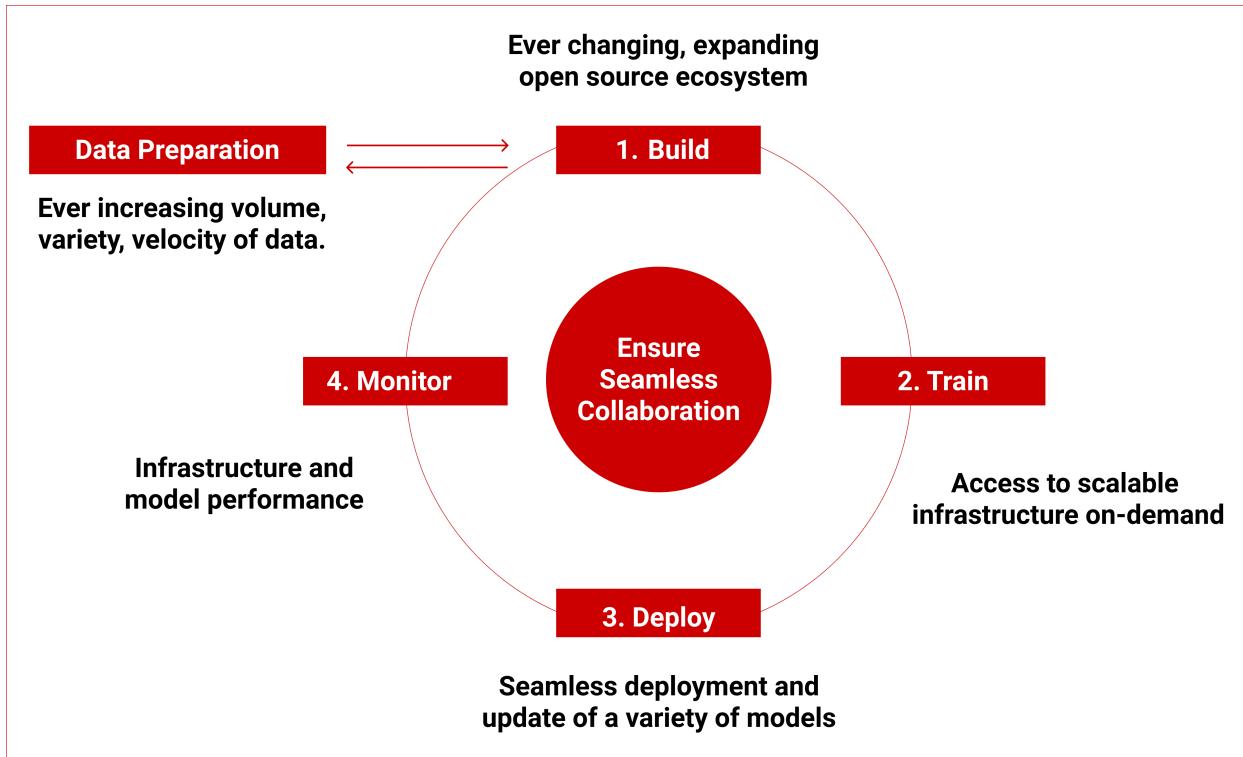
Motivation



Database Management Functional Framework (DMBok)



Machine Learning Operations (MLOps) Life Cycle



Product Road Map

FY22 Quater 1

- Team Onboarding and Formation
- Source & Features Identification
- Personas and User Identification
- Vision Computing Algorithm exploration
- Prediction Algorithm exploration
- Usability Test User Identification
- User Research

FY22 Quater 2

- Data Acquisition
- Data Pre-Processing
- Tensor Flow Environment Setup
- Features Selection for Model
- Training & Testing Data Preparation
- Multiple Model Training Execution
- Multiple Model Comparison and Validation

FY22 Quater 3

- User Interface Creation
- Model Run Through UI
- Compare Model Accuracy Through UI
- Usability Testing with users (Always be Validating)

FY22 Quater 4

- Machine Learning Operations (MLOps)
- Productise the model in production
- Monitor the model accuracy and performance
- Bug Fixing and model improvement.

FY22 - Product Planning (1)

Aa Name	Assign	Property	Status
<u>Card 1</u>			
<u>Card 2</u>			
<u>Card 3</u>			
<u>Onboarding Vision Computing & Database Engineering Team</u>			FY22 Q1
<u>Product Increment Planning Q1: Product Kick-off</u>			FY22 Q1
<u>Q1 Product Review & Retrospective</u>			FY22 Q2
<u>Q2 Product Review & Retrospective</u>			FY22 Q3
<u>Product Increment Planning Q2</u>			FY22 Q2
<u>Sprint 1:(FY22 - W1 & W2)</u>			FY22 Q1
<u>Sprint 2:(FY22 - W3 & W4)</u>			FY22 Q1
<u>Sprint 3:(FY22 - W5 & W6)</u>			FY22 Q1
<u>Sprint 4:(FY22 - W7 & W8)</u>			FY22 Q1
<u>Sprint 5:(FY22 - W9 & W10)</u>			FY22 Q1
<u>Sprint 6:(FY22 - W11 & W12)</u>			FY22 Q1
<u>Q3 Product Review & Retrospective</u>			FY22 Q4
<u>Product Increment Planning Q3</u>			FY22 Q3
<u>Sprint 7:(FY22 - W13 & W14)</u>			FY22 Q2
<u>Sprint 8:(FY22 - W15 & W16)</u>			FY22 Q2
<u>Sprint 9:(FY22 - W17 & W18)</u>			FY22 Q2
<u>Sprint 10:(FY22 - W19 & W20)</u>			FY22 Q2
<u>Sprint 11:(FY22 - W21 & W22)</u>			FY22 Q2

Aa Name	Assign	Property	Status
<u>Sprint 12:(FY22 - W23 & W24)</u>			FY22 Q2
<u>Product Increment Planning Q4</u>			FY22 Q4
<u>Sprint 13:(FY22 - W25 & W26)</u>			FY22 Q3
<u>Sprint 14:(FY22 - W27 & W28)</u>			FY22 Q3
<u>Sprint 15:(FY22 - W29 & W30)</u>			FY22 Q3
<u>Sprint 16:(FY22 - W31 & W32)</u>			FY22 Q3
<u>Sprint 17:(FY22 - W33 & W34)</u>			FY22 Q3
<u>Sprint 18:(FY22 - W35 & W36)</u>			FY22 Q3
<u>Sprint 19:(FY22 - W37 & W38)</u>			FY22 Q4
<u>Sprint 20:(FY22 - W39 & W40)</u>			FY22 Q4
<u>Sprint 21:(FY22 - W41 & W42)</u>			FY22 Q4
<u>Sprint 22:(FY22 - W43 & W44)</u>			FY22 Q4
<u>Sprint 23:(FY22 - W45 & W46)</u>			FY22 Q4
<u>Sprint 24:(FY22 - W47 & W48)</u>			FY22 Q4
<u>FY22 Product Review & Retrospective</u>			FY22 Q4

Thank you!
Any questions?

Financial

<https://s3-us-west-2.amazonaws.com/secure.notion-static.com/4faa4df0-40bb-4dac-a2c2-42c8cce62fb/Target-Corporation-Reports-Third-Quarter-Earnings.pdf>

Year	Revenue in mil. USD\$	Net Income in mil. USD\$	Total Assets in bil. USD\$	Employees	Stores
2005	46,839	3,918	32,293	292,000	1,308
2006	52,620	2,408	34,995	338,000	1,397
2007	59,490	2,787	37,349	352,000	1,488
2008	63,637	2,849	44,560	366,000	1,591
2009	64,948	2,214	44,106	351,000	1,682
2010	65,357	2,488	44,533	351,000	1,740
2011	67,390	2,920	43,705	355,000	1,750
2012	69,865	2,929	46,630	365,000	1,763
2013	73,301	2,999	48,163	361,000	1,778
2014	71,279	1,971	44,553	366,000	1,917
2015	72,618	1,636	41,172	347,000	1,790
2016	73,785	3,363	40,262	341,000	1,792
2017	69,495	2,737	37,431	323,000	1,802
2018	71,879	2,934	38,999	345,000	1,822
2019	75,356	2,937	41,290	360,000	1,851
2020	78,112	3,281	42,779	368,000	1,904
2021	93,561	4,368	50,471	401,000	1,909

Source: https://en.wikipedia.org/wiki/Target_Corporation

 Lead Product Owner - DB Engineering (1).

